Review of Environmental Factors

Ryde to Pymble Pipeline Upgrade (September, 2025)

Sydney WATER

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Sydney Water respectfully acknowledges the Traditional Custodians of the land and waters on which we work, live and learn. We pay respect to Elders past and present.

Sydney Water recognises the physical and cultural connection of local Aboriginal communities to waters and the land.

Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of the Ryde to Pymble Pipeline Upgrade proposal. The REF was prepared under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with Sydney Water both the proponent and determining authority.

The Sydney Water Project Manager is accountable for ensuring the proposal is carried out as described in this REF. Additional environmental impact assessment may be required if the scope of work or work methods described in this REF change significantly following determination.

Certification

I certify that I have reviewed and endorsed this REF and, to the best of my knowledge, it is in accordance with the EP&A Act and the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation). The proposal has been considered against matters listed in section 171 (Appendix A) and the guidelines approved under section 170 of the EP&A Regulation. The information it contains is neither false nor misleading.

Prepared by:	Reviewed and endorsed by:	Endorsed by:
[redacted]		
Prinya Khamphounvong Senior Environmental Scientist Sydney Water Date: 23/09/2025	Jude Gregory Environmental Assessment Team Manager Sydney Water Date: 23/09/2025	Eugene O'Hanlon Project Manager Sydney Water Date: 26/09/ 2025

Decision Statement

The main potential construction environmental impacts of the proposal include amenity impacts from noise and vibration, traffic and impacts to biodiversity. No impacts are expected during operation. The proposal will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats. Therefore, a Species Impact Statement (SIS) and/or Biodiversity Development Assessment Report (BDAR) is not required.

Given the nature, scale and extent of impacts and implementation of the mitigation measures outlined in this REF, the proposal is unlikely to have a significant impact on the environment. Therefore, we do not require an Environmental Impact Statement (EIS) and the proposal may proceed.

Determined by:	Murray Johnson, Senior Manager Environment and Heritage, Sydney Water	Date: 30/09/2025
	[redacted]	

1. Introduction

1.1 Context

Sydney Water provides water, wastewater, recycled water and some stormwater services to over five million people. We operate under the *Sydney Water Act 1994* and have three equal objectives to protect public health, protect the environment and be a successful business.

We are a statutory State-owned corporation and are classified as a public authority, and a determining authority for the proposal under Division 5.1 of the EP&A Act. This REF assesses the potential environmental impacts associated with the Ryde to Pymble Pipeline Upgrade (the proposal) and identifies mitigation measures to avoid or minimise potential impacts.

1.2 Proposal background and need

Table 1-1 summarises the proposal need, objectives and consideration of alternatives.

Table 1-1 Proposal need, objectives and consideration of alternatives

Aspect	Relevance to proposal
Proposal need	The Prospect Water System is the largest and most central water supply system in the Greater Sydney Metropolitan area. The Prospect Water System includes the Prospect North and Ryde delivery systems, which currently service a population of 1.6 million. There is significant growth forecasted in these systems, with the population expected to increase to 2.1 million by 2031 and 2.4 million by 2056. Water transfer and rebalancing between the Prospect North and Ryde systems has not been possible since 2014, as it relied on the Ryde to Pymble 03 (RP03) water main. RP03 was decommissioned in 2014 due to its poor condition. This removed critical network redundancy and weakened interconnectivity between the two systems. The Prospect North system is forecasted to exceed system capacity by the end of 2027, and without RP03 the Ryde system cannot support Prospect North. Strategic planning identified the opportunity to upgrade RP03 and put it back into service to meet system planning objectives. Upgrading RP03 will increase the water delivery systems' servicing capacity and increase resilience. Additionally, the enhanced capacity of the Ryde system will cater for increased growth within the North Shore.
Proposal objectives	The proposal objectives are to: • increase drinking water supply infrastructure to cater for growth • increase drinking water resilience by providing a contingency supply from the Ryde system.
Consideration of alternatives/options	An options assessment process informed the proposal design. A do-nothing approach was not considered as it did not deliver the proposal's growth and resilience objectives. Servicing options were assessed based on criteria

Aspect	Relevance to proposal

	including their ability to deliver the proposal objectives, social and community outcomes, technical feasibility, potential environmental impacts and cost.
	
	Based on these criteria, the proposal assessed in this REF is the preferred option. It is a mixture of trenched and trenchless methodology that generally follows the decommissioned water main alignment.
	
	Options through Lane Cove National Park
	
	Part of the decommissioned water main alignment goes through Lane Cove National Park (LCNP). Two options were identified for this section of the alignment:
	
	• Option 1 – use the existing pipeline
	  ○ connect to existing pipeline by thrust bore under the M2
	  ○ trench through LCNP, which requires National Parks and Wildlife Service (NPWS) approval and assumes all works are kept in the existing pipeline easement
	  ○ construct a new pipeline on the existing pipe bridge over the Lane Cove River
	• Option 2 (preferred option) – underbore between the southern end of Kissing Point Road and the northern end of Vimiera Road.
	
	Option 1 was ruled out based on community impacts, loss of vegetation and likely LCNP closures.
	
	Options near Twin Creeks Reserve
	
	Two options were identified for the section of the alignment near Twin Creeks Reserve.
	
	• Option 1 – underbore the reserve and connect to existing pipeline by horizontal directional drilling
	• Option 2 (preferred option) – open trench along nearby roads.
	
	Option 1 was ruled out based on community impacts and loss of vegetation.

1.3 Consideration of Ecologically Sustainable Development

Table considers how the proposal aligns with the principles of ecologically sustainable development (ESD).

Table 1-2 Consideration of principles of ESD

Principle	Proposal alignment
Precautionary principle – *if there are threats of serious or irreversible environmental damage, lack of scientific uncertainty should not be a reason for postponing measures to prevent environmental degradation. Public and private decisions should be guided by careful evaluation to avoid serious or irreversible damage to the environment where*	The proposal will not result in serious or irreversible environmental damage. The proposal equipment and methodologies are proven and will be delivered by experienced contractors. Potential impacts have been assessed and minimised to the greatest extent possible during the concept design phase. There is minimal scientific uncertainty relating to the proposal.

Principle	Proposal alignment
practicable, and an assessment of the risk-weighted consequences of various options.	
Inter-generational equity – *the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*	The proposal will maintain the health, diversity and productivity of the environment. The proposal will help meet the needs of future generations by providing a resilient drinking water service.
Conservation of biological diversity and ecological integrity – *conservation of the biological diversity and ecological integrity should be a fundamental consideration in environmental planning and decision-making processes.*	The proposal will not significantly impact on biological diversity or impact ecological integrity. Vegetation trimming and clearing has been minimised to the greatest extent possible during concept design. This minimises the impact to Threatened Ecological Communities (TEC), threatened species and habitat features. Sydney Water will offset removed vegetation.
Improved valuation, pricing and incentive mechanisms–- *environmental factors should be included in the valuation of assets and services, such as 'polluter pays', the users of goods and services should pay prices based on the full life cycle costs (including use of natural resources and ultimate disposal of waste) and environmental goals*	The proposal will provide cost efficient use of resources and provide optimum outcomes for the community and environment. Sustainability factors such as carbon footprint (e.g. fuel type, efficiency and usage) were considered in choosing the preferred methodology. The proposal ensures that drinking water supply is maintained to support population growth.

2. Proposal description

2.1 Proposal details

Table 2-1 describes the proposal and Figure 2-3 to Figure 2-11 shows the location and key environmental constraints.

Table 2-1 Description of proposal

Aspect	Detailed description
Proposal details	The proposal involves constructing a DN900 water main approximately 9.5 kilometres (km) between West Ryde Pumping Station and a connection point (WK0085) at Roland Avenue, Wahroonga. The alignment generally follows the decommissioned RP03 water main. A 250 metre (m) section of DN750 water main will be constructed to duplicate the inlet main at Wahroonga Reservoir. The proposal also requires minor ancillary works such as new valves and connections to the existing water network. The proposal is within Ryde City Council and Ku-ring-gai Council, spanning multiple suburbs. Part of the proposal includes a trenchless crossing under the M2 motorway and LCNP. LCNP is a national park reserved under the *National Parks and Wildlife Act 1974* (NPW Act). The portion of the proposal under the LCNP is assessed in a separate REF to be determined by NPWS. The launch pit for the trenchless methodology under LCNP is within lot 3 DP881923 and lot 2 DP881923 on privately owned land. The retrieval shaft is within the road verge of Kissing Point Road near lot 5 DP229165 on land owned and managed by Ku-ring-gai Council. Outside of LCNP the proposal will be open trenched and micro-tunnelled. Figure 2-3 to Figure 2-11 shows the proposal location, construction compounds and key environmental constraints.
Methodology	**Pre-construction work** Customer and stakeholder engagement and notification will occur before and throughout construction. Pre-construction work includes investigations such as utility surveys, geotechnical and contamination bores, pits and monitoring wells. Site establishment includes: • mark out construction areas including access routes, areas for temporary material and machinery storage • negotiate temporary access requirements with property owners for the construction period • trim/remove vegetation • set up temporary construction compounds (e.g. establish site sheds and amenity blocks, connect to water and electricity supply) • install environmental controls (e.g. noise barriers, erosion and sediment controls) • deliver and store materials and equipment.

Construction

The proposal will be constructed using open trenched (trenching) and trenchless (direct pipe and micro-tunnel) methods. Figure 2-1 shows the micro-tunnelling arrangement and Figure 2-2 shows general direct pipe methodology.

Trenching for pipe installation

Trenches will be up to about 2.7 m wide and about 3 m deep. The new water main will be laid with a standard cover of 1.5 m. Multiple construction crews will work progressively along the water main alignment at about 10-20 m per shift.

Some sections of the existing RP03 main will be exhumed involving:

- open trench to the depth of the existing water main
- dispose of old pipes and fittings to a licensed waste facility.

Trenchless construction

Micro-tunnelling involves the following:

- excavate launch and receival pits (about 7 m long, 4 m wide)
- assemble micro-tunnelling machine in the pit
- excavate tunnel
- extract spoil via vacuum system
- slipline water main pipes.

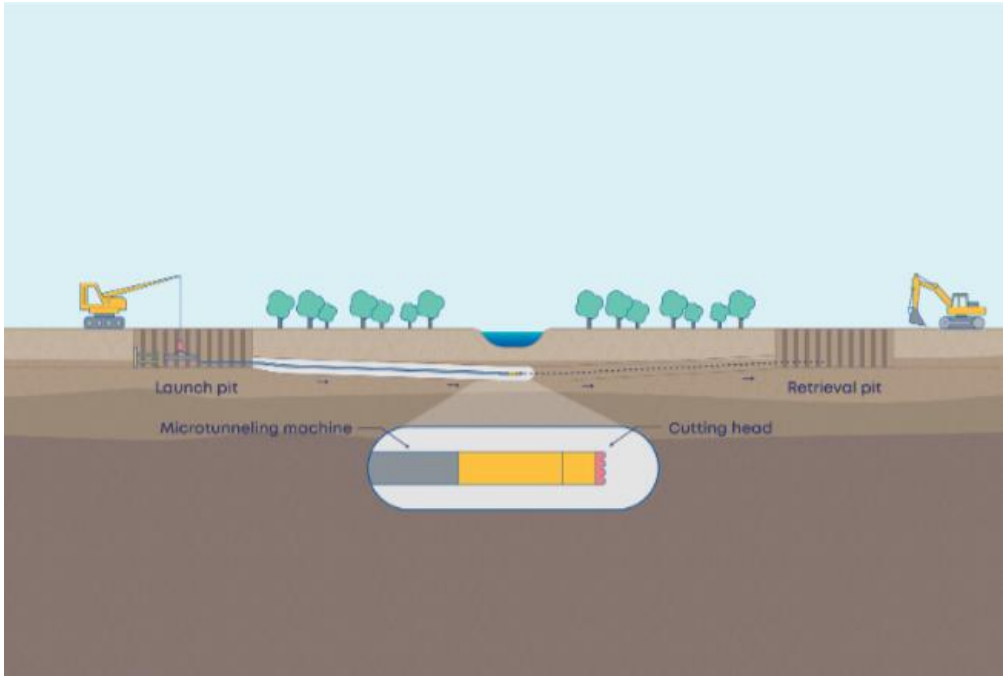

Figure 2-1 Typical micro-tunnelling methodology

Direct pipe methodology involves the following:

- excavate a launch shaft within the launch pit, with an in-ground concrete thrust block at the base and a receival shaft within the receival pit
- excavate the face by a tunnel boring machine (TBM). The TBM will tunnel a 1.3 m diameter bore, advancing a DN1200 steel casing
- tunnel bore at a depth of 15-40 m below ground level (estimated 8 m under the Lane Cove River based on concept design)

Aspect	Detailed description
	• transport spoil to the surface using a closed-loop slurry system, where it is processed and removed via sealed trucks • reconfigure the shaft to use a pipe thruster to push a prefabricated pipeline to the receival shaft (delivered in 12 m lengths and progressively welded and tested) • install a DN900 mild steel cement lined carrier pipe within the steel casing • fill the annulus between the casing pipe and the cement lined carrier pipe with flowable grout.  Figure 2-2 Typical direct pipe methodology Connect to the existing water network: • isolate system • drain water • cut existing pipe and install flow meters, spools and valves • tie-in new water main to existing network.
Commissioning	Commissioning involves testing the new equipment. The exact commissioning steps depend on the type of the equipment, but for this proposal will include: • pipeline cleaning • pressure leak testing • performance testing, including sampling where required.
Ancillary facilities (compounds)	Construction compounds will be required to house site sheds, construction amenities and materials laydown. The launch and retrieval pits and laydown areas are within the construction corridor. However, other construction compounds will also be used (see Figure 2-3 to Figure 2-11 and list below). • West Ryde Pumping Station – 948 Victoria Road, West Ryde • Hermitage Reservoir 1, 2 and 3 – 343 Blaxland Road Ryde and 20 Goulding Road West Ryde • Abuklea corridor – 103 Abuklea Road, Marsfield • Culloden Road – 211 Culloden Road, Macquarie Park

Aspect	Detailed description
	• Vimiera Road – 109, 250 and 283 Vimiera Road • Kissing Point Road – 245 Kissing Point Road and near lot 5 DP229165 • Yeramba Park – 1 Acacia Close, Turramurra • Wahroonga Reservoir –1676 Pacific Highway, Wahroonga • Potts Hill Reservoir – Lot 107 DP1153671. If other compound areas are needed but not yet identified, they will be assessed in accordance with the mitigation measures in Section 5.
Restoration	The work sites will be restored as close possible to the pre-existing condition following construction, in consultation with landowners. Site restoration activities include: • backfill trenches and pits as soon as works are finished (or as needed to make the work area safe in between shifts) • dismantle construction compounds, remove and dispose of waste material and remove construction signage • remove temporary access tracks • restore road pavement surfaces and drainage • offset planting where required.
Materials/ equipment	Plant, equipment, and vehicles include: • excavators with hammers • backhoe • direct pipe – tunnel boring machine • direct pipe – pipe thruster • moxy dumper • welding rig • vacuum truck • slurry pump • slurry separation unit • truck and dog • bogie truck • micro-tunnelling - crane truck • semi trailers • vibratory roller • tipper truck • hydraulic power unit • light vehicles • generator • crawler crane • bentonite mixer and pump • drilling control cabin • desander plant

Aspect	Detailed description
	• centrifuge • mobile light tower • micro-tunnelling semi trailer • hand tools • float - low loader.
Work hours	Where possible, work and deliveries will be scheduled to occur during standard daytime hours: • 7 am to 6 pm, Monday to Friday • 8 am to 1 pm, Saturdays • No work Sundays or public holidays. The proposal will require work outside these hours, such as for connections to the existing network, or for Road Occupancy Licence (ROL) requirements. This has been assessed in Section 5.
Proposal timing	Construction is expected to start early 2026 and take about 15 months.

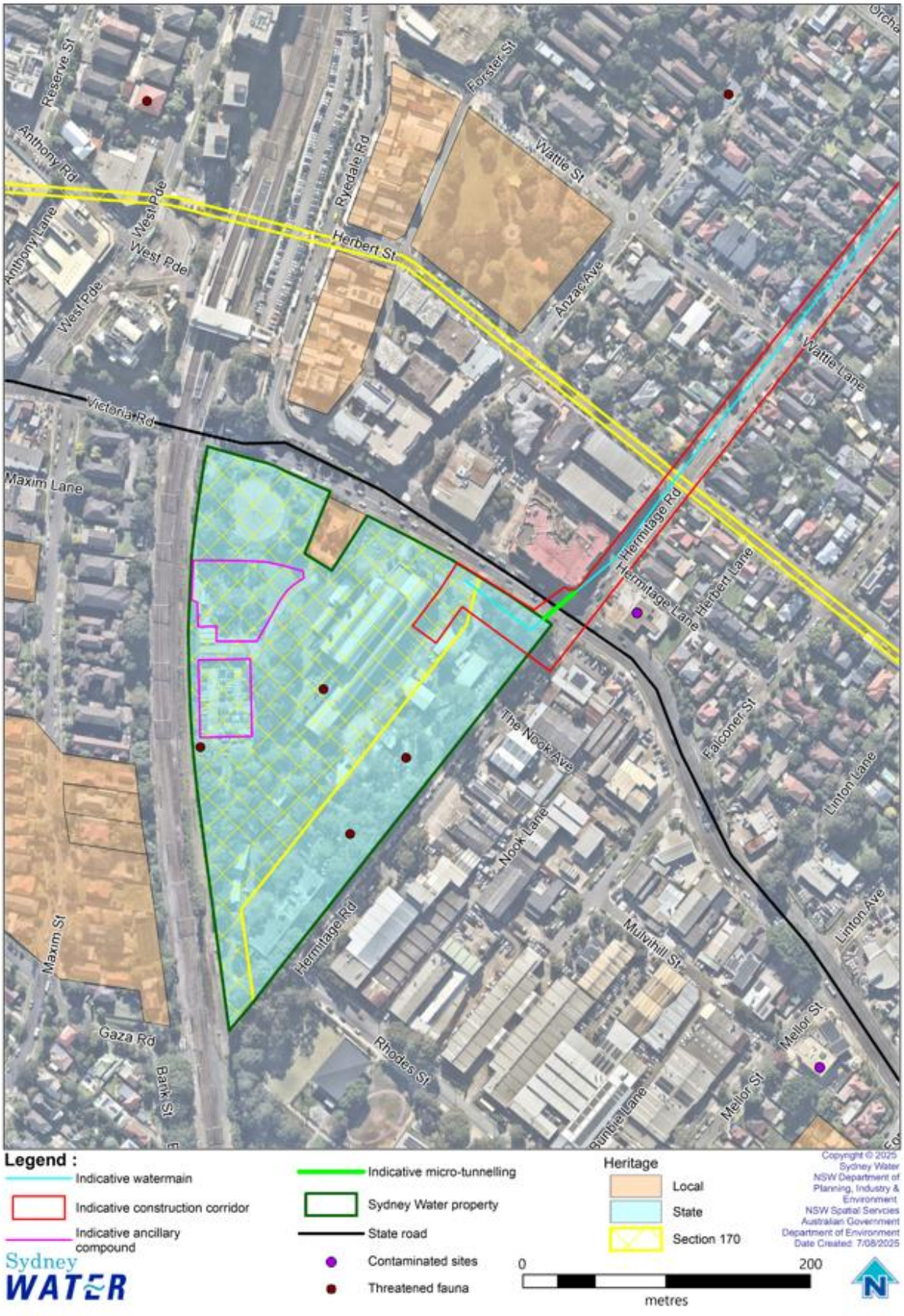

Figure 2-3 Environmental constraints - West Ryde Pumping Station

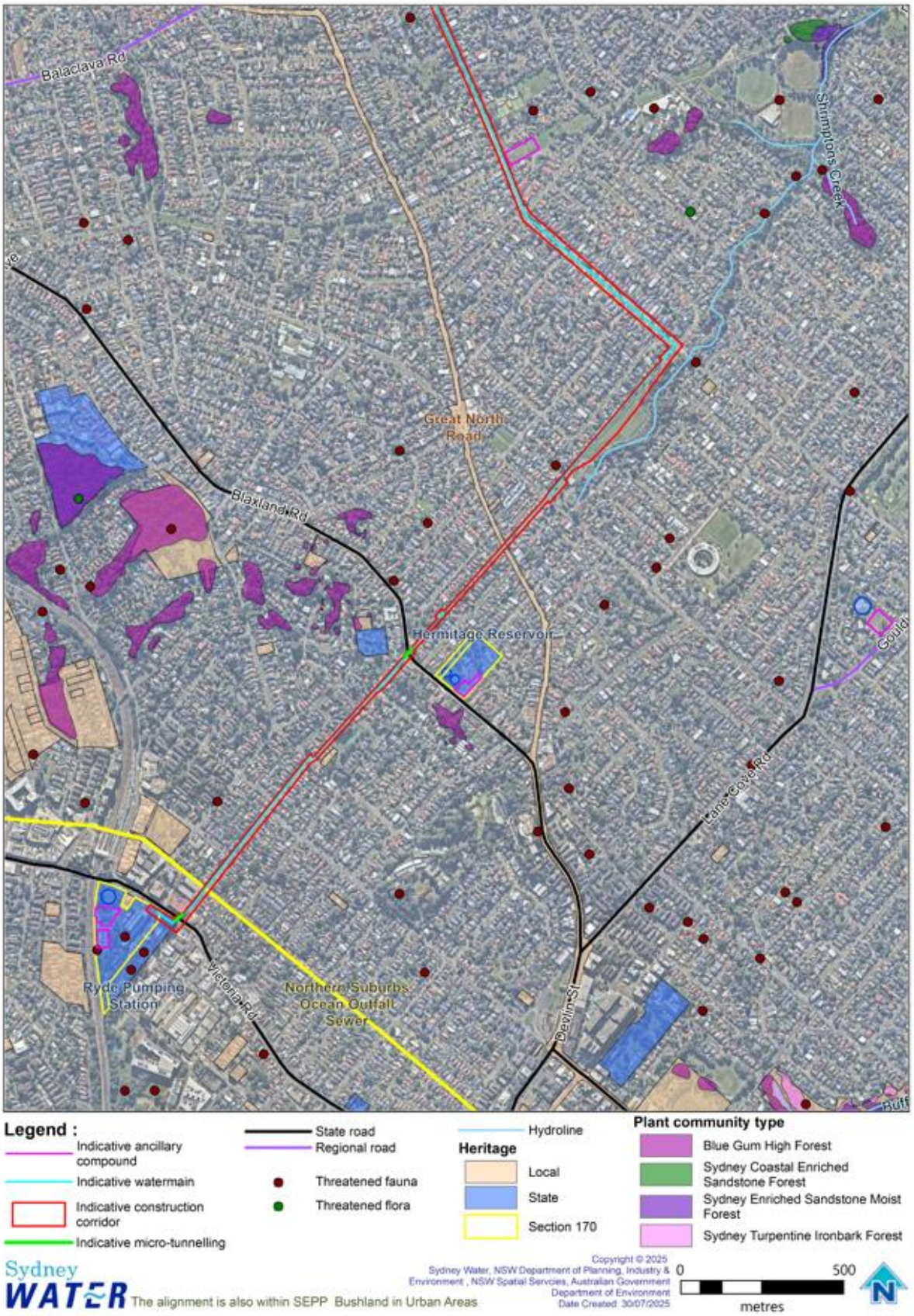

Figure 2-4 Environmental constraints - Ryde south

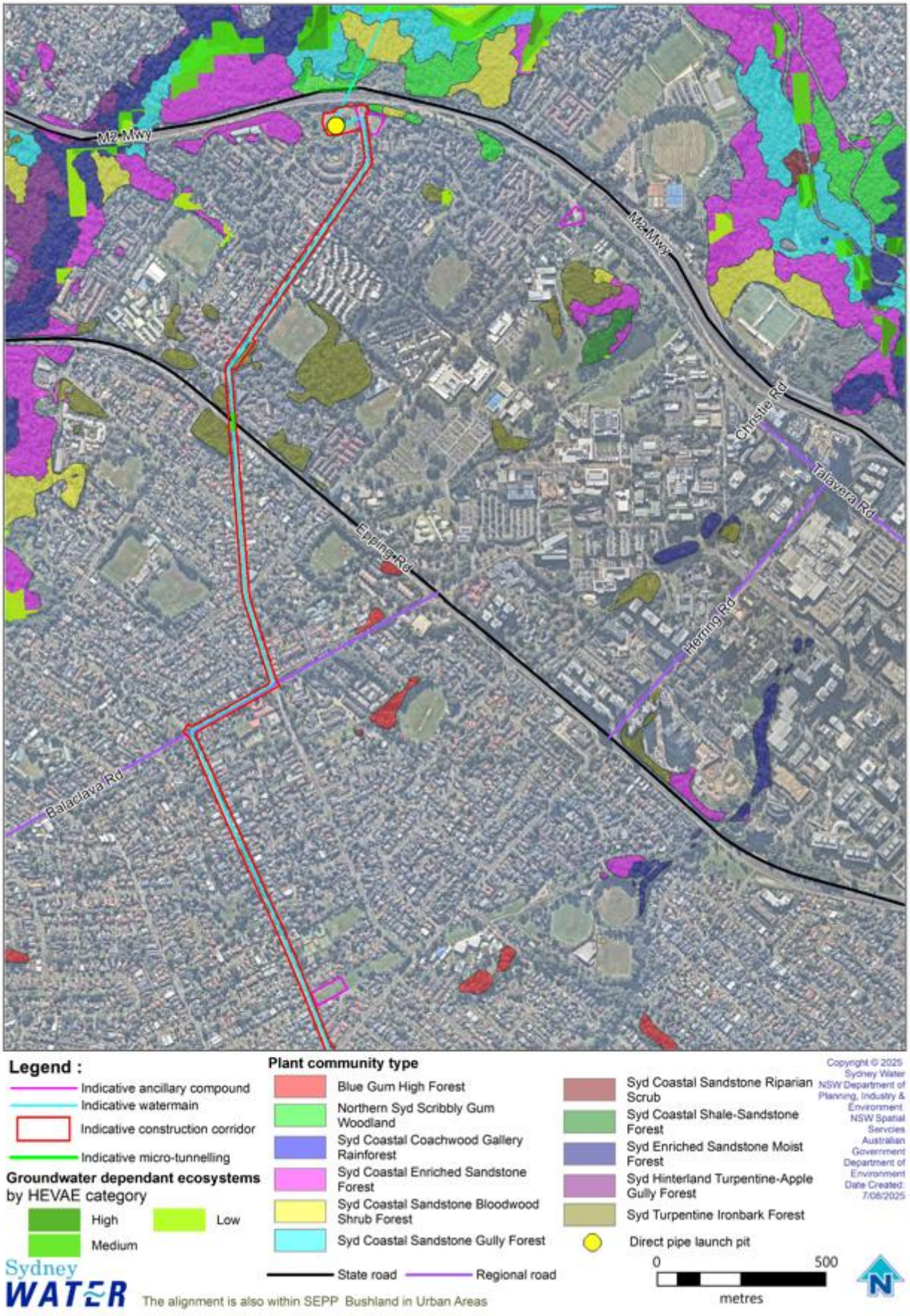

Figure 2-5 Environmental constraints - Ryde north (1 of 2)

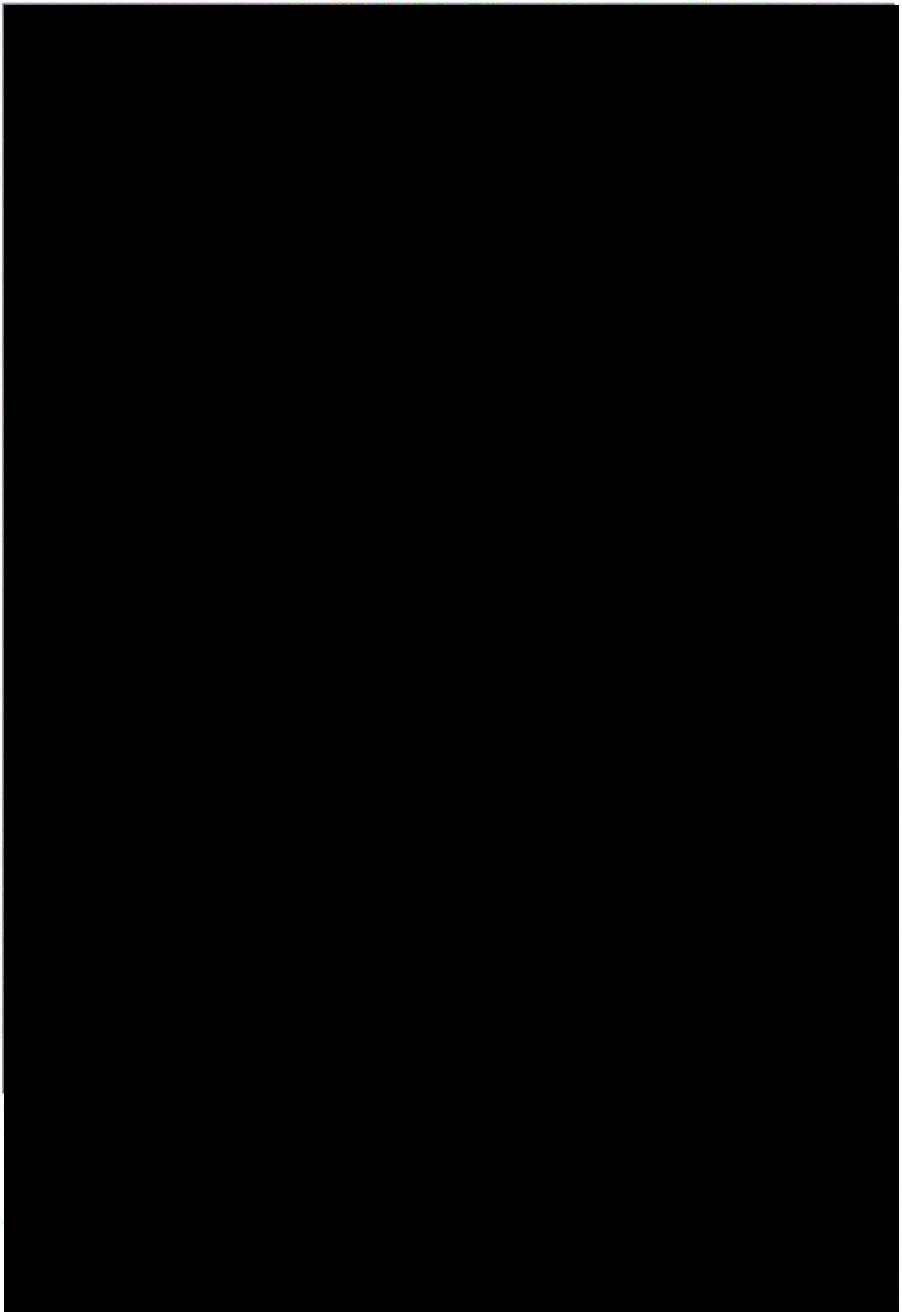

Figure 2-6 Environmental constraints - Ryde north (2 of 2)

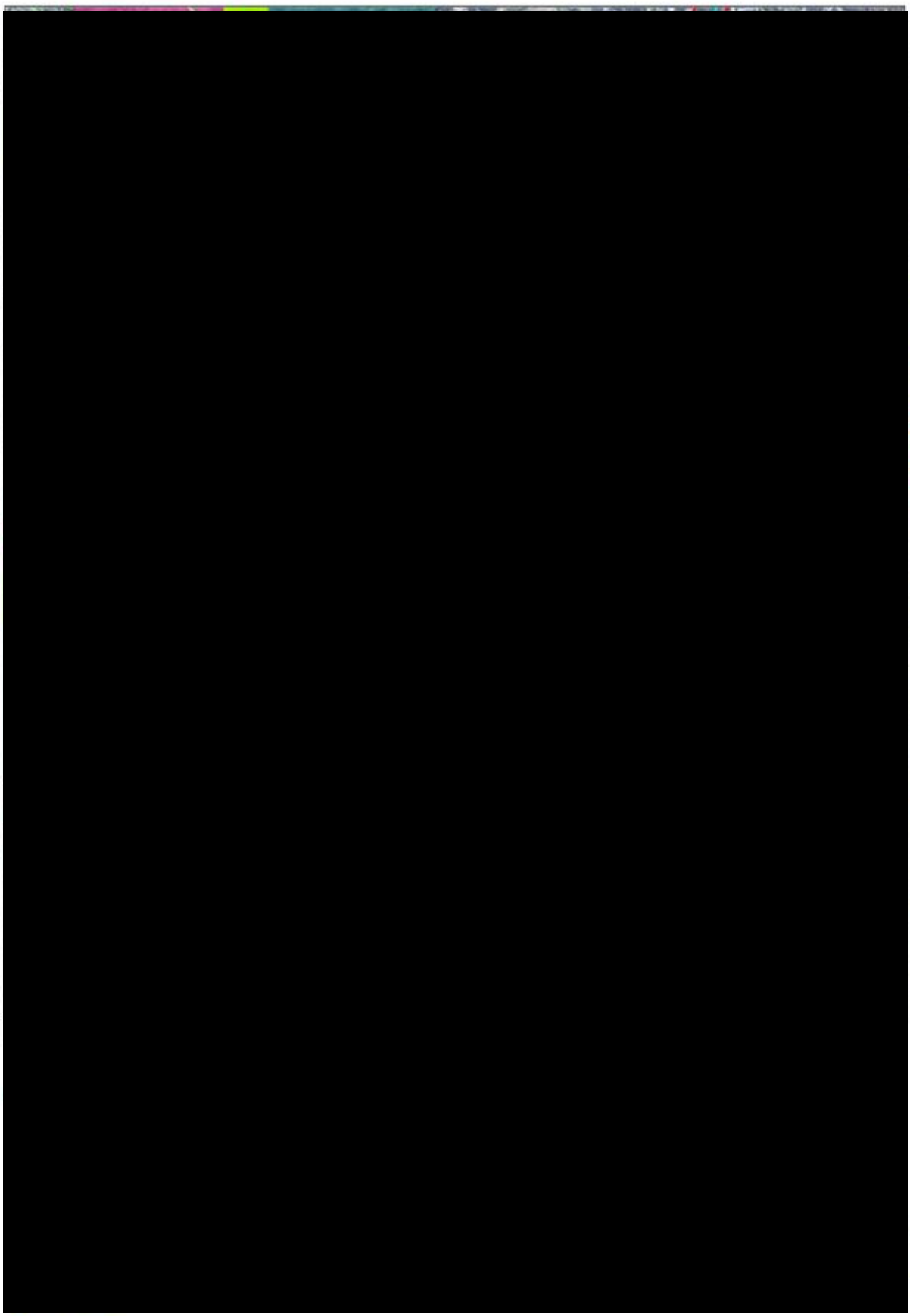

Figure 2-7 Environmental constraints - LCNP crossing

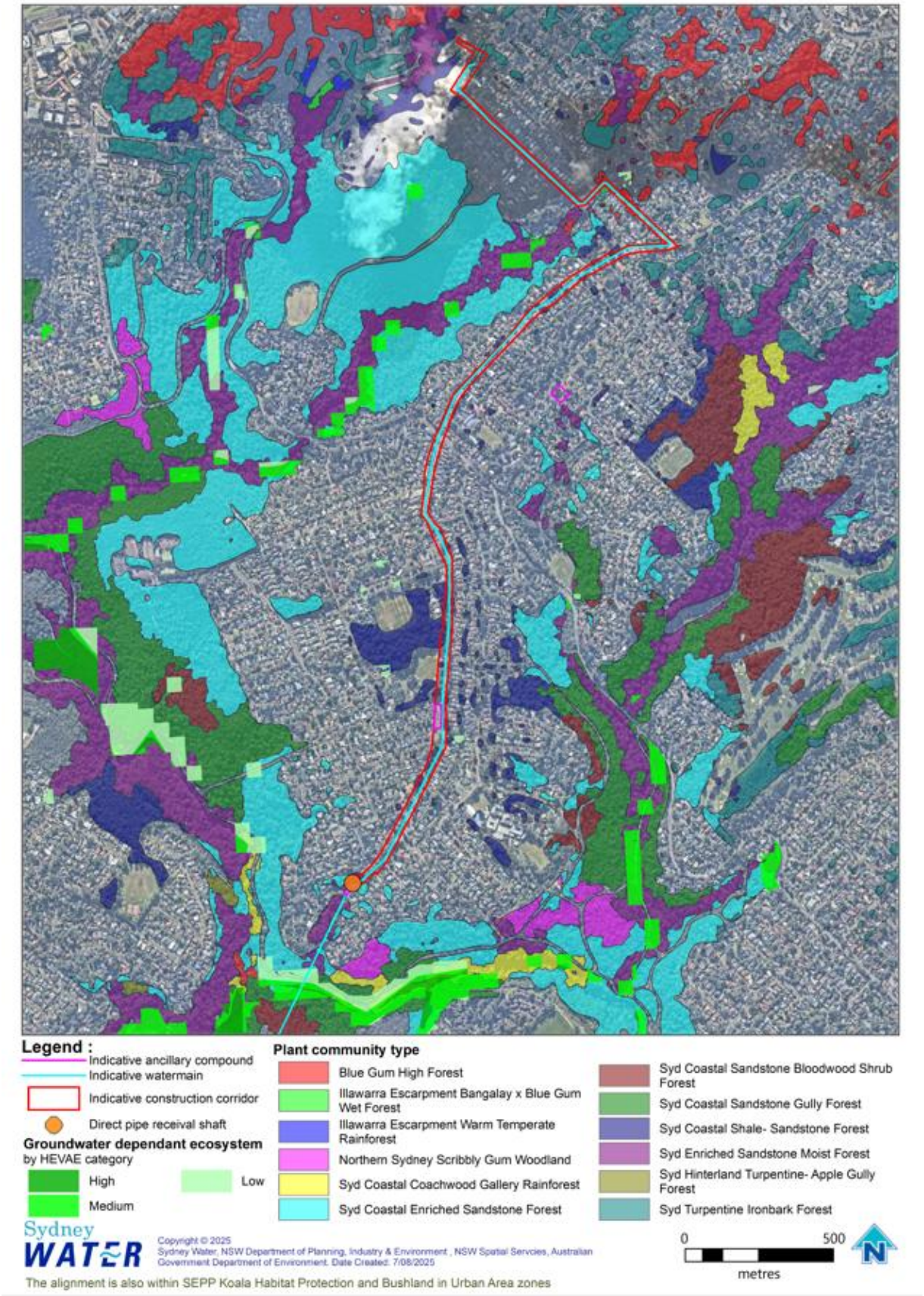

Figure 2-8 Environmental constraints - Ku-ring-gai (1 of 2)

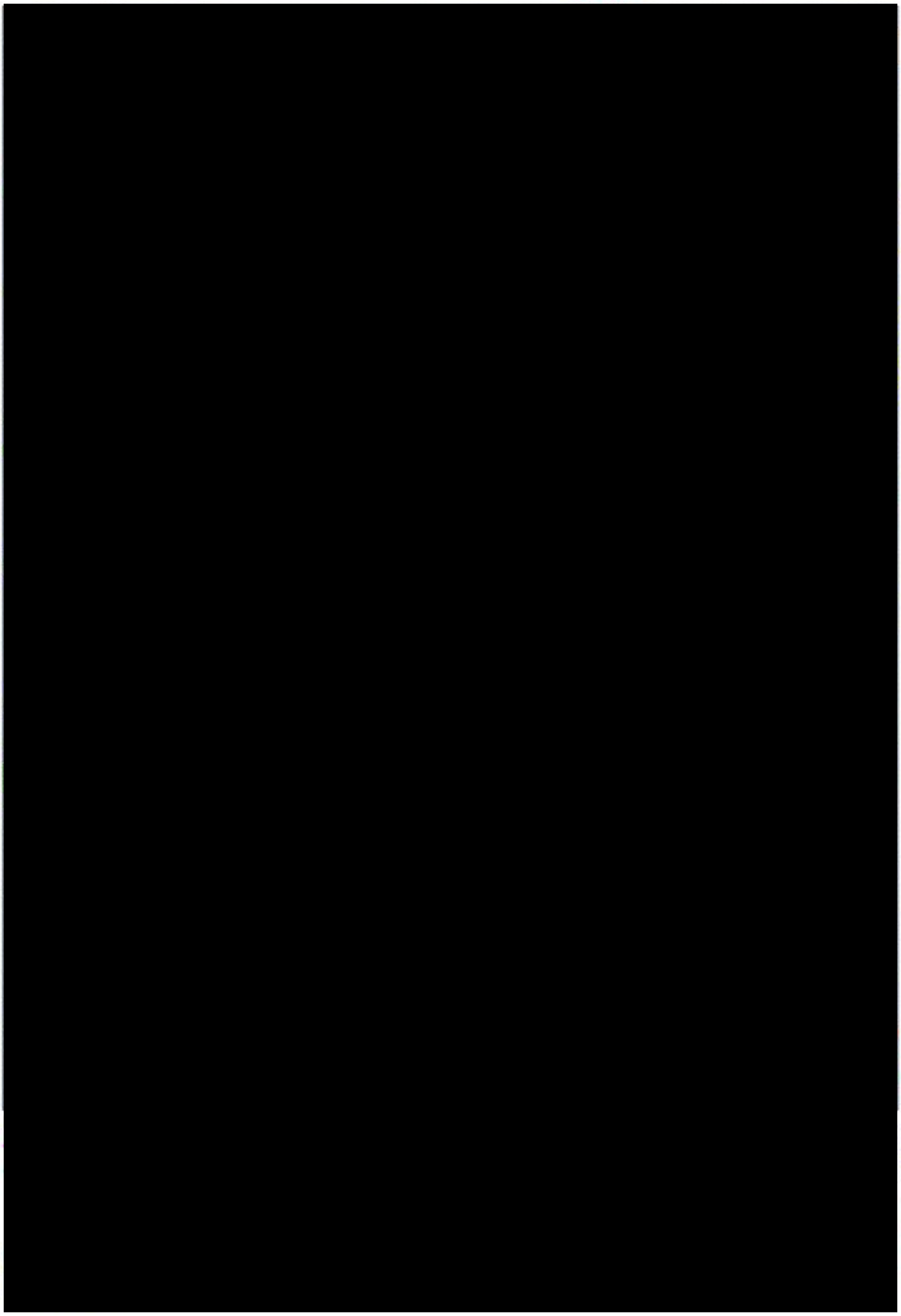

Figure 2-9 Environmental constraints - Ku-ring-gai (2 of 2)

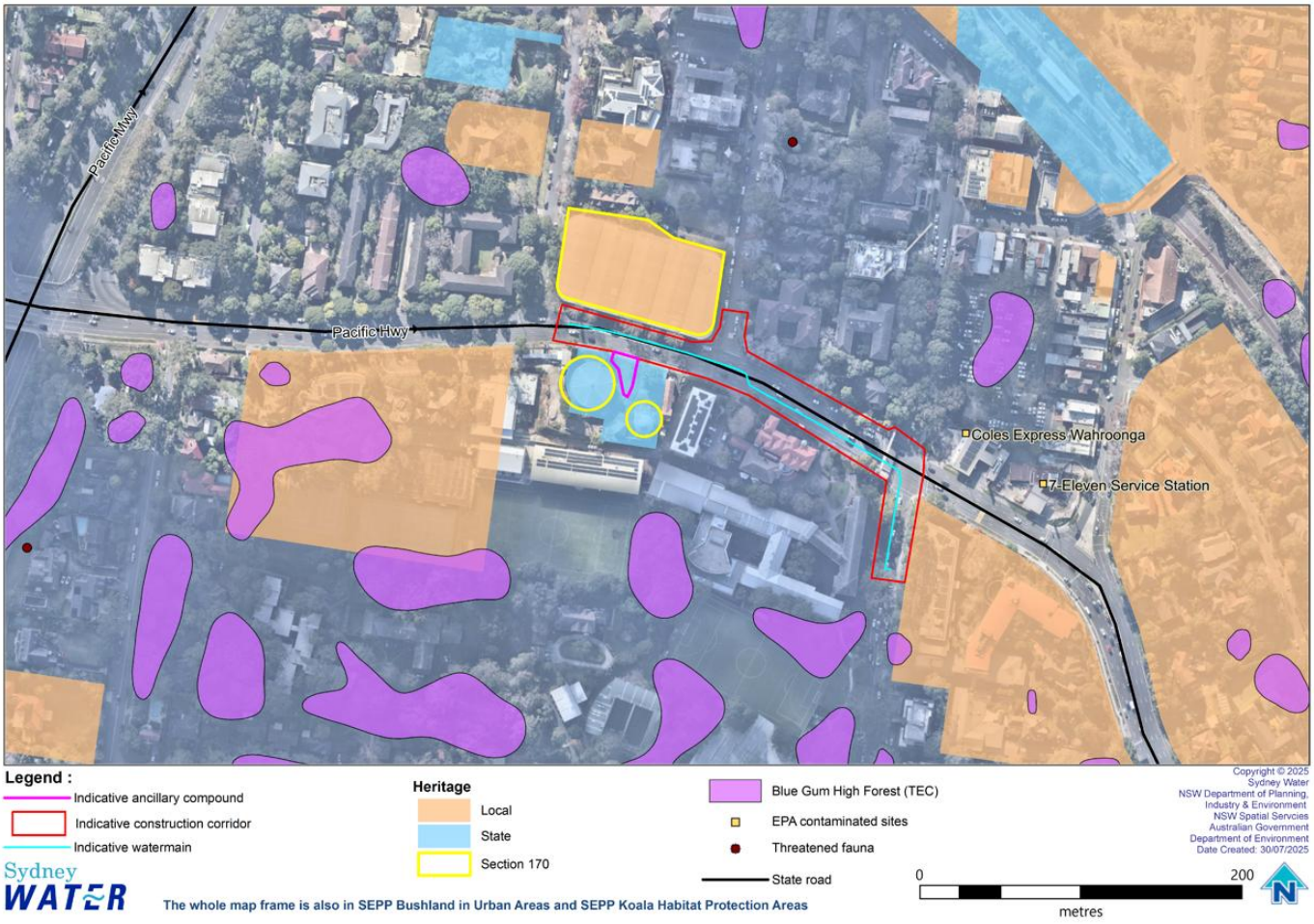

Figure 2-10 Environmental constraints - Wahroonga Reservoir

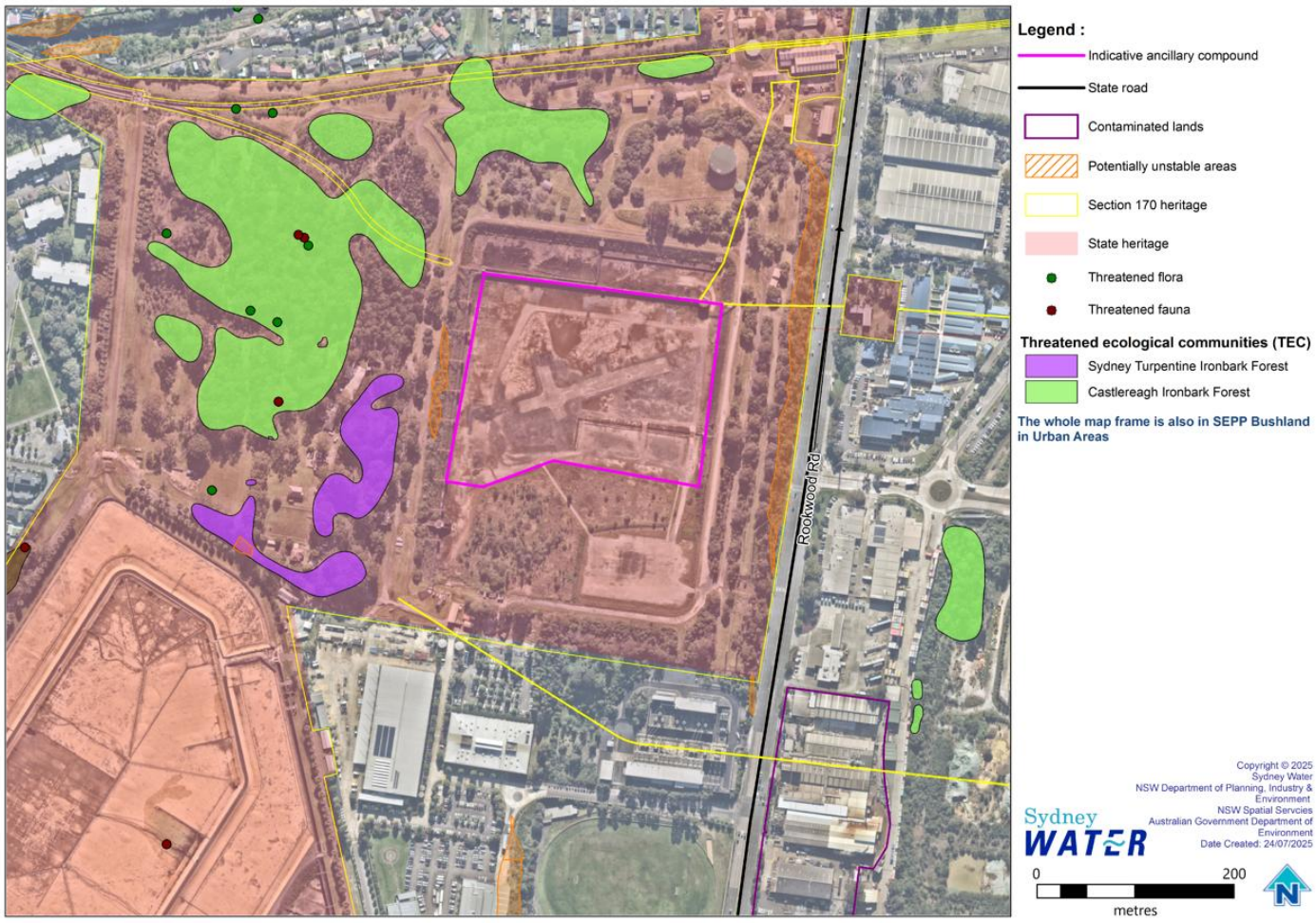

Figure 2-11 Environmental constraints - Potts Hill

2.2 Construction corridor and changes to the scope of work

The proposal shown in this REF is indicative and based on the latest concept design at the time of REF preparation. A broader ‘study area’ was considered to inform the landscape context. The construction corridor incorporates the construction activities and ancillary facilities. It is about 20 to 30 m wide in trenched sections, including roads, road verge and laydown areas. The construction corridor is wider in some sections to accommodate launch and receival pits (see Section 2.1 for dimensions). The construction corridor width may be restricted in certain areas such as to minimise environmental impacts or in road reserves to avoid private property impacts. Ancillary facilities are in various locations and of differing sizes (see Figure 2-3 to Figure 2-11).

The final proposal may change based on detailed design or construction planning. The general mitigation measures outline when changes to the proposal trigger supplementary environmental impact assessment. If required, further assessment must be prepared in accordance with SWEMS0019. An addendum is not required provided the change:

- remains within the construction corridor and has no net additional environmental impact, or
- is outside the construction corridor but reduces the overall environmental impact of the proposal (subsection 5.4(a) of the EP&A Act).

3. Consultation

3.1 Community and stakeholder consultation – general

Our approach to community and stakeholder consultation is guided by Sydney Water's community and stakeholder engagement guidelines.

Stakeholder and community engagement is a planned process of initiating and maintaining relationships with external parties who have an interest in our activities. Community and stakeholder engagement:

- enables us to explain strategy, policy, proposals, proposal or programs
- gives the community and stakeholders the opportunity to share their knowledge, issues and concerns
- enables us to understand community and stakeholder views in our decision-making processes alongside safety, environment, economic, technical and operational factors.

The nature, scale and extent of the proposal's potential impact has been evaluated in this REF. If our work impacts the community in some way, we will consult with affected groups throughout the proposal. This includes engaging the broader community and stakeholders during plan or strategy development or before making key decisions.

We will also provide local councils with reasonable notice when we will start works. Local council(s) will be consulted about matters identified in environmental planning instruments such as public safety issues, temporary works on council land, and full or partial closures of council managed roads (refer below).

3.2 Community and stakeholder consultation – proposal

A Community and Stakeholder Action Plan (CSAP) was developed to guide community engagement activities through design and delivery of the proposal. The CSAP helps Sydney Water to:

- identify the directly and indirectly affected landowners and other stakeholders, including government agencies and interest groups
- identify issues likely to be of high community / stakeholder concern
- incorporate stakeholder views into the proposal planning and delivery.

On 22 August 2025, a community notification introducing the proposal was distributed to over 8000 residents within 0.5 km of the construction corridor and advertised on the proposal webpage.

Consultation to date has included:

- quarterly meetings with Transurban and TfNSW to discuss construction impacts around the M2, and Pacific Highway. The delivery contractor will undertake further community consultation as part of detailed design.
- monthly meetings with City of Ryde and Ku-ring-gai Council. These meetings informed the suitability of construction compounds within each LGA.
- notifications to community groups, bushcare groups and First Nation community groups.
- community information sessions, including 2 drop-in sessions and 2 online webinars. In general, community members were interested in seeing the alignment of the pipeline in relation to their property. Community members were also interested in:

- construction hours/timeframes and traffic management
- construction methodology (e.g. trenching and tunnelling)
- noise and vibration levels
- compound locations, including preferences around the location of the Vimiera Road compound
- impacts to the Lane Cove National Park
- impacts to trees around Monteith Road
- impact to Abbotsleigh School.

During the community information sessions, positive feedback was also received about traffic management plans around the Vimiera Road compound and avoiding impact to Twin Creeks Reserve.

None of the stakeholder feedback received resulted in a change in alignment or methodology. However, consultation with key stakeholders will continue throughout detailed design, construction, and commissioning. We will also continue to consult with impacted community members, and inform stakeholders about the project start date, where we will be working and when, as well as what to expect during each stage of the project.

This REF and other proposal information will be available on the Sydney Water's Ryde to Pymble Pipeline Upgrade proposal webpage.

3.3 Consultation required under State Environmental Planning Policies and other legislation

Sydney Water must consult with councils and other authorities for work in sensitive locations or where the work may impact other agencies' infrastructure or land. This is specified in the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP).

Consultation was required under TISEPP with Ryde City Council, Ku-Ring Gai Council and NPWS as the proposal involves:

- installing a temporary structure on, or enclosing a public place under council's management or control that is likely to disrupt pedestrian or vehicle traffic – section 2.10(1)(e)
- excavating a footpath or road for which council is the roads authority – section 2.10(1)(f).

A meeting was held between representatives from Ryde City Council on 11 September 2025 and Kur-Ring Gai Council on 26 August 2025. The proposal scope, benefits, and objectives were discussed, as well as environmental matters related to TISEPP consultation. Formal TISEPP letters were sent to the Councils on 19 August. No response was received from the Councils in relation to TISEPP matters within the 21 day consultation period. Further detail is provided in Appendix B.

The proposal involves trenchless construction under Biodiversity Stewardship Agreement (BSA) site BA00132 (Sheldon Forest, Rofe Park and Comenarra Creek Reserve Biobanking Agreement) and LCNP. There is no legislative requirement to consult with the Biodiversity Conservation Trust (BCT) regarding the BSA, however Sydney Water notified the Trust in July 2025and BCT responded on 11 August 2025 they had no objections to the proposal.

A separate REF has been prepared for the LCNP section of the proposal within land administered under the NPW Act, with NPWS as the determining authority. We consulted with NPWS and key matters raised

included potential impacts to groundwater, surface water, hydraulic fracturing fluid migration (frac out), settlement, biodiversity, user access, and cumulative environmental impacts. These matters were assessed in the separate REF. NPWS indicated that following review and determination of the NPWS REF, Sydney Water would be referred to the Property and Commercial unit to obtain the relevant construction licence to construct the works. Once the works are completed Sydney Water will obtain an easement from NPWS for the project in accordance with Part 12 of the NPW Act.

4. Legislative requirements

4.1 Environmental legislation

Sydney Water is the proponent and determining authority under the EP&A Act. The proposal does not require development consent and is not classified as State significant infrastructure. We have assessed this proposal under Division 5.1 of the EP&A Act. This REF has concluded that the proposal is unlikely to have a significant impact on the environment.

The following environmental planning instruments (Table 4-1) and legislation (Table 4-2) are relevant to the proposal. Table 4-2 also documents any licences and permits required, and timing and responsibility for obtaining them.

Table 4-1 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Ryde Local Environmental Plan 2014 (Ryde LEP) Ku-ring-gai LEP Local Environmental Plan 2015 (Ku-ring-gai LEP)	The proposal is on land zoned: • C2 Environmental Conservation • C4 Environmental Living • R4 High Density • R3 Medium Density Residential • R2 Low Density Residential • RE1 Public Recreation • SP2 Infrastructure.
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Section 2.159(1) of the TISEPP permits development by or on behalf of a public authority for water reticulation systems without consent on any land. There are some limitations on land reserved under the NPW Act. As Sydney Water is a public authority and the works assessed in this REF are not on land reserved under the NPW Act, the proposal is permissible without consent.
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BCSEPP)	**Vegetation in non-rural areas (Chapter 2)** The proposal is in an area or zone listed in subsection 2.3(1). However, subsection 2.4(1) states: '*This Policy does not affect the provisions of any other SEPP….*', and as the works are permissible under the TISEPP, a council permit to clear vegetation under this SEPP is not required. **Koala habitat protection (2020 and 2021) (Chapter 3 and 4)** These chapters aim to encourage the proper conservation and management of areas of natural vegetation that provide koala habitat. This is to ensure that permanent free-living populations are protected in their present range, and to reverse the current trend of population decline.

Environmental Planning Instrument	Relevance to proposal
	The SEPP contains prescriptions for the consideration of 'potential koala habitat' and 'core koala habitat' for developments within local government areas listed in schedule 2 of the SEPP. The proposal is on land zoned as koala habitat. Although koala feed trees (eucalypt species) are present in the construction corridor, the vegetation is highly disturbed, fragmented and urbanised. Koalas have a low likelihood of occurrence in the study area and are likely to use more suitable areas outside of the construction corridor such as LCNP and Ku-ring Gai National Park. Potential impacts to koalas are considered in Appendix C. No additional approvals are required. **Water catchments (Chapter 6)** Chapter 6 of this SEPP applies as the proposal is within the regulated Hawkesbury Nepean and Sydney Harbour Catchments. Section 5 of this REF assessed potential environmental impacts on water quality and quantity, aquatic ecology, flooding, access, cultural heritage, flora and fauna, and scenic quality. The assessment confirmed that potential impacts are minor and meet the requirements of part 6.2 of the SEPP (refer to Appendix A).

Table 4-2 Consideration of key environmental legislation

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Protection of the Environment Operations Act 1997 (POEO Act)	This act aims to, among other matters, protect, restore and enhance the quality of the environment in NSW. It includes offences for polluting the environment and establishes a regime of environment protection licences. The delivery contractor is responsible for immediately reporting pollution incidents in accordance with SWEMS0009 - Responding to incidents with an environmental impact. Construction and operation of the proposal is not a scheduled activity. An Environment Protection Licence (EPL) is not required.	N/A	Delivery contractor during construction for pollution incidents.
Biodiversity Conservation Act 2016 (BC Act)	A specialist ecology assessment (Appendix C) identified 3 TECs in the construction corridor area. Five threatened fauna species listed under the BC Act were recorded, or assessed to have a medium or greater	REF	Pre-construction, Sydney Water

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	likelihood of occurring in the construction corridor. Tests of Significance (ToS) confirmed no significant impacts are expected to any threatened fauna species or communities listed under the BC Act. Preparation of a SIS or opting in to the NSW Biodiversity Offsets Scheme is not required.		
National Parks and Wildlife Act 1974 (NPW Act)	An Aboriginal heritage due diligence assessment was completed for the proposal (Appendix D). No registered Aboriginal sites or Aboriginal objects were identified during a visual inspection of the construction corridor. Aboriginal archaeological sensitivity of the study area was assessed as low. The proposal will involve direct pipe construction through LCNP, established under the NPW Act. This section of the water main is assessed under a separate REF to be determined by NPWS.	NPWS REF	Pre-construction, Sydney Water
Heritage Act 1977	The proposal is within the curtilages of local and State listed heritage items protected under this Act. Potential impacts to local heritage listed items are assessed as minor or inconsequential. A Statement of Heritage Impact (SoHI) confirmed that no further approval or permit is required. Potential impacts of the proposal on non-Aboriginal heritage are assessed in Section 5.4.	REF	Pre-construction, Sydney Water
Water Act 1912/ Water Management Act 2000	Groundwater dewatering is needed during excavation and direct pipe methodology. Any groundwater dewatering requires a Water Supply Works Approval (WSWA) before dewatering starts.	WSWA	During REF if details known during planning (Sydney Water to initiate). Otherwise, pre-construction, delivery contractor
Roads Act 1993	The proposal will involve work in, on or over a public road. Section 138 of this Act states a person must not carry out work in, on or over a public road	ROL	Pre-construction, delivery contractor

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	without consent of the responsible roads authority, via a ROL. Works on local roads will be managed via a Traffic Management Plan agreed with the relevant council. Potential impacts of the proposal on traffic and access, including road works, are described in Section 5.8.		
Biosecurity Act 2015	The object of this Act is to provide a framework for the prevention, elimination and minimisation of biosecurity risks. Several priority Weeds of National Significance (WoNS) were identified in the construction corridor. Weeds must be managed in accordance with the general biosecurity duty.	N/A	Delivery contractor during construction
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act is the principal environmental law administered by the Commonwealth. It provides for the protection of matters of national environmental significance. Under the EPBC Act, an action that is likely to have a significant impact on a matter of national environmental significance must be referred to the Commonwealth Minister for the Environment and Water. An assessment using the significant impact guidelines for potential impacts to EPBC listed TECs and fauna species confirmed that the proposal is not likely to have a significant impact.	REF	Pre-construction, Sydney Water

5. Environmental assessment

This section describes the existing environment and assesses direct and indirect impacts of construction and operation**.** It also identifies mitigation measures to minimise impacts. These will be incorporated into contract documents and a Construction Environmental Management Plan (CEMP) (or similar) prior to starting work.

5.1 Topography, geology and soils

Existing environment

The topography within the study area is undulating and largely follows natural contours, sloping downhill towards Lane Cove River. A desktop search identified the geology within the construction corridor is a mix of Ashfield Shale and Hawkesbury Sandstone. The search indicated that the construction corridor has a low salinity hazard and extremely low probability of occurrence for acid sulfate soils. The proposal is not in a mine subsidence area.

Potential impact

The main potential impacts to geology and soils during construction are from:

- erosion and sedimentation from excavation and spoil management
- contamination from:
    - accidental chemical, drilling fluid and fuel spills
    - frac out during direct pipe and micro-tunnelling, including polymers used to manage frac out risk
- ground subsidence/settlement after open trenching or under boring.

Excavated material will be stockpiled within the construction corridor or within compounds. In the event of rainfall, stockpiled material has the potential to erode and lead to sedimentation and impact water quality.

There is the potential for soil contamination during construction due to accidental leaks or spills, oils or other chemicals from plant, equipment and vehicles used during construction. Spill kits will be available to reduce the potential impacts of accidental spills and leakages.

The direct pipe and micro-tunnelling methodology has the potential to cause frac outs (drilling intercepting faults and fractures in the rock or roadway where drilling fluid escapes to the environment). However, geotechnical investigations (KBR May 2025, Sydney Water 2024) have confirmed the ground conditions (e.g. no dykes or faults) and potential risks can be managed by the mitigation measures. Drilling fluids and polymers will be environmentally benign. Use of the direct pipe methodology further reduces this risk as the drilling fluid pressures are significantly lower than other trenchless solutions.

The delivery contractor has assessed potential settlement for the underbore. They predicted the risk of a hole collapse during construction is very low as it is continually supported with steel casing pipe and passes through competent geology.

The direct pipe method excavates the tunnel continuously and immediately supports it with a thrust pipe or casing, preventing hole collapse and subsequent settlement. To mitigate the risk of the TBM becoming stuck, it can be retracted partway through pipe installation. During micro-tunnelling the risk of the drill head

getting stuck is low. However, if the drill head were to get stuck a second micro-tunnelling machine will be launched from the receival pit to retrieve the drill head and complete the excavation.

Construction activities will temporarily alter the surface topography and associated drainage patterns during trenching and stockpiling. The excavations will be progressively backfilled and restored to existing conditions and no long-term impacts from the proposal are expected. Subsidence along the rest of the alignment is unlikely given standard backfill compaction practices.

Impacts to topography, geology and soils are not expected during operation.

Mitigation measures

With the implementation of the mitigation measures below, impacts to topography, geology and soils can be adequately managed, and residual impacts are expected to be minor.

Table 5-1 Environmental mitigation measures — topography, geology and soils

Mitigation measures
Prevent sediment moving offsite in accordance with Managing Urban Stormwater, Soils and Construction, Volume 1 and 2A (Landcom 2004 and DECC 2008), including, but not limited to: • develop a Soil and Water Management Plan (SWMP) as part of the CEMP • divert surface runoff away from disturbed soil and stockpiles • install sediment and erosion controls before construction starts • reuse topsoil where possible and stockpile separately • inspect controls at least weekly and immediately after rainfall • rectify damaged controls immediately • remove controls once surfaces have been stabilised, including removing trapped sediment in drainage lines.
Minimise ground disturbance and stabilise disturbed areas progressively.
Delivery contractor to ensure imported material is Virgin Excavated Natural Materials (VENM) or meets a relevant NSW EPA Resource Recovery Order and Resource Recovery Exemption, or is a commercially supplied material that is not waste. If using materials that are subject to a NSW EPA Resource Recovery Order/Exemption the delivery contractor must ensure the conditions in that Order/Exemption are strictly adhered to.
Stop work during heavy rainfall or in waterlogged conditions when there is a risk of sediment loss off site.
Sweep up any sediment/soil transferred off site at least daily, or before rainfall.
Eliminate ponding and erosion by restoring natural landforms to the pre-works condition.
Keep functioning spill kit on site for clean-up of accidental chemical/fuel spills. Keep the spill kits stocked and located for easy access.
Locate portable site amenities, chemical storage and stockpiles of erodible materials away from watercourses, drainage lines and flood prone areas.
Keep stockpiles to a minimum and ensure adequate contingency measures are in place to prevent sedimentation of waterways in the event of a large flood event.
Bund potential contaminants and store on robust waterproof membrane, away from drainage lines.
Underboring methods will be appropriately managed by experienced drilling contractors using fit-for-purpose equipment for the specific ground conditions to ensure no impacts to the surrounding environment occurs. Additional hydro fracture assessment to be undertaken during detailed design.

Mitigation measures

The delivery contractor will prepare Drilling Fluid Management Plan to avoid impacts and may include mitigation measures such as:

- analyse the pressures on the drilling head during the bore
- contain and monitor drilling fluids at entry/exit points
- reduce the pressure on the drill head if needed
- if require, drilling fluid return lines will be tested prior to use
- bentonite slurry will be designed to maintain positive pressure in the bore hole annulus and minimise groundwater ingress
- polymer will be added to the drilling fluids if required
- drilling fluids and polymers will be benign (e.g. bentonite will meet NSF/ANSI-60 Drinking Water Additive Standards)
- drilling fluid will be monitored and tested at regular intervals and additional products added to maintain the fluid at an optimal performance
- Loss Circulation Material (LCM) may be used to prevent further loss of drilling fluid if a frac out were to occur. LCM is a naturally occurring, non-toxic, and inert substance
- drilling fluid returns will be monitored as an indicator of bore condition
- drilling fluids will be cleaned (cuttings removed) prior to reuse
- daily drilling fluid reports
- in the unlikely event of a frac out in the park, works will cease, and an experienced support team will immediately remediate the drilling fluid loss in consultation with NPWS.

5.2 Water and drainage

Existing environment

The main waterways in the broader study area are the Lane Cove River and its tributaries. The Lane Cove River is mapped as key fish habitat. The proposal is outside of flood planning areas (Ryde LEP 2014 and Lane Cove LEP 2009) and is unlikely to be flood affected by a 1% annual exceedance probability (AEP) event.

There is potential for groundwater to be encountered along the construction corridor, particularly close to Ryde Pump Station and LCNP. Based on preliminary groundwater investigations, it is expected that groundwater is shallower near waterways and deeper in areas of relatively higher elevation. Data from 4 Sydney Water boreholes close to LCNP found groundwater levels between 4 and 10 m below top of the bore (KBR, May 2025). KBR determined groundwater levels are relatively stable. This indicates that geological formation is relatively tight and the speed of movement of groundwater through the formation in this area is very low.

Potential impact

The proposal requires excavation, direct pipe works and micro-tunnelling, temporary soil stockpiles and the storage of fuels and chemicals. The proposal has the potential to impact water and drainage from:

- sedimentation from poor site management of excavations and stockpiles
- contamination from accidental chemical/fuel spills
- drilling fluids or polymers impacting groundwater water quality through frac outs
- groundwater drawdown from dewatering open excavations or tunnel bores.

Potential sedimentation, contamination and drilling fluid/polymer impacts are assessed in Section 5.1 above and can be managed by the above mitigation measures. Similarly, topographic and drainage patterns potential impacts are assessed above.

As dewatering groundwater is needed, a WSWA is required before dewatering starts. Preliminary estimates indicate the volume of groundwater to be extracted is 0.143 ML. Additional groundwater investigations during the detailed design will confirm standing groundwater levels and groundwater dewatering calculations.

The direct pipe methodology is a closed, balanced system. Groundwater drawdown will be negligible as the bore is cased within a pipe as it is constructed, and positive drilling fluid pressure will be maintained. As such, groundwater drawdown along the underbore will be negligible. However, groundwater inflow and drawdown is likely from excavation of the direct pipe launch shaft. We expect the drawdown zone to be limited to 1 m around the launch shaft, with about 0.03 ML of groundwater dewatered. The receival shaft is not expected to encounter groundwater.

Mitigation measures

With the implementation of the mitigation measures below, impacts to water and drainage can be adequately managed and residual impacts are expected to be negligible.

Table 5-2 Environmental mitigation measures — water and drainage

Mitigation measures
Sydney Water will obtain a groundwater Water Supply Works Approval. The delivery contractor will: • prepare a Dewatering Management Plan prior to construction • comply with the conditions of the approvals (such as protecting water quality; minimise aquifer extraction volumes, monitor extraction with flow meters and recording volumes).
Ongoing monitoring of groundwater levels in existing bores within the park to confirm no significant change attributed to the project during construction.
Minimise groundwater ingress during detailed design. As part of the CEMP, prepare a Dewatering Management Plan for groundwater dewatering. This should include elements such as how water quality will be protected and how extraction volumes will be monitored.
Discharge all water in accordance with Sydney Water's Water Quality Management During Operational Activities Policy (D0001667) including erosion controls, discharge rate, dechlorination, monitoring. Re-use potable / groundwater water where possible.
Dewater excavations in accordance with the Program Delivery Guidance Standard 9.1 Excavation Dewatering (ENV-GS-001).
Seek approval and discharge criteria from the relevant Sydney Water Network Area Manager prior to discharge of water to the wastewater system. Otherwise tanker by a licensed waste contractor and dispose off-site to an appropriately licensed facility.
Store all chemicals and fuels in accordance with relevant Australian Standards and Safety Data Sheets. Record stored chemicals on site register. Ensure bunded areas have 110% capacity of the largest chemical container, or an additional 25% capacity of the total volume stored within (whichever is greater). Tightly secure chemicals and fuels in vehicles. Clearly label all chemicals.
Conduct refuelling, fuel decanting and vehicle maintenance in compounds where possible. If field refuelling is necessary, designate an area away from waterways and drainage lines with functioning spill kits close by.
Conduct any equipment wash down within a designated washout area.
Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak-free item.

5.3 Flora and fauna

A biodiversity assessment report (BAR) was prepared by Aurecon (2025) to assess the potential impacts of the proposal on flora and fauna. Findings and recommendations outlined in the BAR are summarised below and provided in full in Appendix C.

Existing environment

Vegetation

Vegetation within the construction corridor includes planted/urban exotic vegetation and native remnant vegetation. Five native plant community types (PCT), were ground-truthed in the construction corridor:

- PCT 3262: Sydney Turpentine Ironbark Forest
- PCT 3136: Blue Gum High Forest
- PCT 3259: Sydney Coastal Shale-Sandstone Forest
- PCT 3595: Sydney Coastal Sandstone Gully Forest
- PCT 3592: Sydney Coastal Enriched Sandstone Forest.

Three TECs were ground-truthed in the construction corridor:

- Blue Gum High Forest of the Sydney Basin Bioregion (EPBC Act and BC Act Critically Endangered)
- Turpentine-Ironbark Forest of the Sydney Basin Bioregion (EPBC Act and BC Act Critically Endangered)
- Duffys Forest Ecological Community in the Sydney Basin Bioregion (BC Act Endangered).

Sheldon Forest, Rofe Park and Comenarra Creek Reserve BSA site BA00132 exists to the north of LCNP near Kissing Point Road.

Threatened flora

No threatened flora species were recorded within the construction corridor. It was assessed that threatened flora species are unlikely to occur in the construction corridor.

Threatened fauna

No threatened fauna were observed within the construction corridor. A likelihood of threatened fauna occurrence was undertaken based on BioNet Atlas and the Protected Matters Search Tool report. Five threatened fauna species were assessed as having a moderate likelihood of occurrence within 10 km of the construction corridor.

- Little Lorikeet (*Parvipsitta pusilla*) (Vulnerable BC Act)
- Little Bent-winged Bat (*Miniopterus australis*) (Vulnerable BC Act)
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*) (Vulnerable BC Act)
- Grey-headed Flying-fox (*Pteropus poliocephalus*) (Vulnerable BC Act and EPBC Act)
- Powerful Owl *(Ninox strenua)* (Vulnerable BC Act).

Weeds

Under Schedule 1 of the *Biosecurity Act (2015)* all private landowners, occupiers, public authorities and councils are required to control weeds on their land. Weeds and non-native species are present in the construction corridor. Several priority WoNS were identified within the construction corridor including:

- Lantana (*Lantana camara*)
- Asparagus fern (*Asparagus virgatus*)
- Fireweed (*Senecio madagascariensis*)
- Blackberry (*Rubus fruiticosis*).

Groundwater Dependent Ecosystems

The construction corridor does not intersect with any aquatic Groundwater Dependent Ecosystems (GDEs). The construction corridor intersects with 2 terrestrial GDEs, Coastal Sandstone Ridgetop Woodland and Hinterland Sandstone Gully Forest. The subterranean GDE map shows that the construction corridor is part of the Greater Metropolitan Region.

Potential impact

The proposal has the potential to directly or indirectly impact flora and fauna through:

- native vegetation and TEC clearing and trimming
- clearing fauna habitat or habitat fragmentation
- groundwater dewatering
- weed spread/incursion
- noise, light or dust.

The proposal requires clearing 89 native remnant trees within the construction corridor. About 0.66 ha of native vegetation will be impacted, of which 0.06 ha is TEC. Table 5-3 below and Figure 6b in Appendix C show the impacted trees and PCT/TEC areas. This is considered a 'worst-case' scenario in which all vegetation is cleared within the construction corridor. It is likely that actual impacts can be minimised by reducing the construction corridor where practicable. The location for offsetting will be decided during detailed design in consultation with council and affected landowners. BSA site BA00132 will be underbored and no impacts are expected.

Table 5-3 Native vegetation/TEC impact area

Native vegetation	Impact area (ha)
PCT 3262: Sydney Turpentine Ironbark Forest	0.03
PCT 3136: Blue Gum High Forest	0
PCT 3259: Sydney Coastal Shale-Sandstone Forest	0.2
PCT 3595: Sydney Coastal Sandstone Gully Forest	0.13
PCT 3595: Sydney Coastal Sandstone Gully Forest	0.3

Total	0.66

TECs	Impact area (ha)
EPBC Act/BC Act - Critically Endangered - Turpentine Ironbark Forest of the Sydney Basin Bioregion	0.026
BC Act– Endangered - Duffys Forest Ecological Community in the Sydney Basin Bioregion	0.035
Total	0.06

ToS for impacts to TECs were assessed in accordance with section 7.3 of the BC Act. The ToS concluded that the proposal will not have a significant impact and therefore a SIS or BDAR are not required. Similarly, the impacts to TECs were assessed in accordance with the EPBC Act *Significant Impact Guidelines* 1.1. The assessments concluded that the proposal is unlikely to have a significant impact and a referral to the Commonwealth Minister for the Environment for determination is not required (refer Appendix C).

Direct impacts from vegetation clearing and trimming will result in the loss of potential habitat for threatened fauna species with a known or a moderate likelihood of occurrence in the construction corridor. The proposal will remove 11 hollow bearing trees. This will be offset in accordance with Sydney Water's Biodiversity Offset Guideline (SWEMS0019.13) (refer to Table 5-4). All other identified hollow bearing trees and stag trees will be avoided where possible (refer to Figure 6b of Appendix C). The removal of these habitat features will have a minor and temporary impact on fauna.

Table 5-4 Offsets required for the proposal

Biodiversity Value Impacted	Total Impact	Proposal Impact	Offset Multiplier	Offset required
Non-statutory offsets for moderate impact: Larger scale impacts (≥ 100 m^2), but that are not considered to be significant e.g. removal of native vegetation associated with new water infrastructure projects or more than one tree, or trees with hollows.				
Non- threatened native vegetation	0.6 ha	Trimming or removal of native vegetation	2:1	1.8 ha
TEC	0.06 ha	Trimming or removal of native vegetation	3:1	0.18 ha
Native remnant trees	89	Trimming or removal of native vegetation	3:1	267 trees to be re-planted
Hollow- bearing trees	11	Trimming trees containing habitat values or removal of habitat values	2:1	11 salvaged hollows or 22 nestboxes if salvage is not possible

The Little Lorikeet is nomadic with movement patterns largely influenced by the availability of nectar resources. Due to its high mobility and capacity to exploit suitable habitats across a broad landscape, the

species is likely to use higher-quality vegetation in LCNP. Similarly, the Little and Large Bent-winged Bat and Grey-headed Flying-fox would migrate to a more opportunistic habitat such as LCNP for roosting and foraging. No Grey-headed Flying-fox camps are recorded within 10 km of the proposal. We are not clearing any vegetation with potential Powerful Owl roosting or breeding habitat. Assessments of significance under the BC Act and EPBC Act were carried out for threatened fauna species with known or moderate likelihood of occurrence (Appendix C). The assessments found that no significant impact to threatened fauna species were likely.

The proposal has the potential to indirectly impact fauna through noise, dust and lighting during construction, particularly near LCNP. The receival shaft/pit at Kissing Point Road is about 230 m from the LCNP and indirect impacts are not anticipated. There is potential for indirect impacts from the launch pit at the Vimiera Road compound south of the M2 (80 m from the edge of LCNP). Light and dust impacts will be managed by standard construction mitigation measures (see Sections 5.6 and 5.9). A noise assessment indicated a negligible increase in noise from the Vimiera Road compound, compared to the existing background noise from the M2 at the edge of LCNP. Further, ecology surveys did not identify any Powerful Owl breeding habitat within 120 m of the Vimiera Road compound. Other species are likely to use the park mainly for foraging and are therefore less likely to be indirectly impacted. Indirect impacts along the remainder of the alignment are not expected due to the temporary and progressive nature of the works, and the ability of threatened species to move away from the construction corridor. A ToS was not required for the Powerful Owl as direct and indirect impacts are unlikely.

The construction corridor has limited wildlife connectivity, particularly within urbanised and heavily disturbed residential areas in the study area. These areas are highly fragmented due to major roads, housing, and commercial developments. However, bushland corridors such as local parks and urban reserves provide some important habitat for native species along the alignment. As the proposal is largely within the road corridor, potential impacts to connectivity are minor. Where clearing is required near parks and urban reserves, offset replanting in these locations can further mitigate potential impacts.

No known pathogens are present in the construction corridor. There is high potential for weed species to be spread through construction machinery movement, as well as soil disturbance and transportation. Multiple weeds (including WoNS) were recorded within the construction corridor and are at higher risk of further invading the local plant communities. The weed spread will be managed with the implementation of the mitigation measures below.

Potential groundwater drawdown during construction is discussed in Section 5.2. Given the expected minimal effect on groundwater levels, potential temporary impacts to terrestrial GDEs are assessed as negligible. No subterranean GDEs are impacted. Groundwater levels will return to baseline after the works finish and potential temporary impacts will be managed by implementing the mitigation measures (see Section 5.2).

No impacts are expected to flora and fauna during operation.

Mitigation measures

With the implementation of the mitigation measures below, impacts to flora and fauna can be adequately managed, and residual impacts are expected to be moderate.

Table 5-5 Environmental mitigation measures — flora and fauna

Mitigation measures

Provided it is essential for delivering the project, Sydney Water's Project Manager can approve the following vegetation removal and tree trimming, without additional environmental assessment (but only after consultation with the Environmental and Community Representatives and affected landowners). Sydney Water considers vegetation removal in these circumstances has minimal environmental impact.
• Any minor:
  ○ vegetation trimming or
  ○ removal of exotic vegetation or
  ○ removal of planted native vegetation
  where the vegetation is not a threatened species (including a characteristic species of a threatened community or population), heritage listed, in declared critical habitat or in a declared area of outstanding biodiversity value.
• Any removal of remnant vegetation where there is no net change to environmental impact (e.g. a different area of vegetation is removed but the total area is the same or less than assessed in the EIA).
Written explanation of the application of this clause (including justification of the need for trimming or removal and any proposed revegetation) should be provided when seeking Project Manager approval. Any impacts to native vegetation and trees must be offset in accordance with the Biodiversity Offset Guideline (SWEMS0019.13).

Offset residual impacts to native vegetation and trees in accordance with the Biodiversity Offset Guideline (SWEMS0019.13) (Offset calculations are listed in Table 5-4). All other identified hollow bearing trees and stag trees will be avoided where possible (refer to Figure 6b of Appendix C). Offsets will be carried out in consultation with council and affected landowners.
Vegetation is highly sensitive, trimming or clearance cannot proceed without written authorisation from the Sydney Water Project Manager (in consultation with Environmental Representative).
Map and report native vegetation clearing greater than 0.01 ha in extent (and any associated rehabilitation) to the Sydney Water Environmental Representative. Track vegetation clearing as per SWEMS0015.26 Contractor Native Vegetation Clearing and Rehabilitation template.
Minimise vegetation clearance and disturbance, including impacts to standing dead trees and riparian zones. Where possible, limit clearing to trimming rather than the removal of whole plants.
Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing.
Minimise vegetation clearance in the construction corridor where practicable.
Adjust methodology (e.g. avoid area, hand excavate, implement exclusion fencing) to protect sensitive areas where possible (such as mature trees, known threatened species, populations or ecological communities).
Protect trees to be retained in accordance with the requirements of Australian Standard 4970-2009 for the Protection of Trees on Development Sites. Do not damage tree roots unless absolutely necessary, and engage a qualified arborist where roots >50mm are impacted within the Tree Protection Zone.
Notify potentially affected residents, council and landowners of any tree removal.
Retain dead tree trunks, bush rock or logs in-situ unless they are in the construction corridor and moving is unavoidable. Reposition material elsewhere on the site or approved adjacent sites. If native fauna is likely to be present, a licenced ecologist should conduct a pre-clearance inspection and undertake fauna relocation.
Ecologist to inspect vegetation for potential fauna prior to clearing or trimming. If fauna is present, or ecological assessment has determined high likelihood of native fauna presence (including hollow bearing trees), engage WIRES or a licenced ecologist to inspect and relocate fauna before works.
If native fauna is encountered on site, stop work and allow the fauna to move away unharassed. Engage WIRES or a licenced ecologist if assistance is required to move fauna.

Mitigation measures

If any threatened species (flora or fauna) is discovered during the works, stop work immediately and notify the Sydney Water Project Manager. Work will only recommence once the impact on the species has been assessed and appropriate control measures implemented.

If any damage occurs to vegetation outside of the construction corridor (as shown in the CEMP), notify the Sydney Water Project Manager and Environmental Representative so that appropriate remediation strategies can be developed.

Manage biosecurity in accordance with:

- *Biosecurity Act 2015* (see NSW Weedwise), including reporting new weed infestations or invasive pests
- contemporary bush regeneration practices, including disposal of sealed bagged weeds to a licenced waste disposal facility.

Record pesticides and herbicides use in accordance with SWEMS0017.

For works in council owned bushland, the delivery contractor will consult with Councils to identify known plant pathogens or pests and management requirements. Prepare a Hygiene Management Plan if there is a risk of infestation and spread.

To prevent spread of weeds, wrap straw bales in geofabric to prevent seed spread.

Bag all plant parts and excavated topsoil that may be infested with weed propagules and dispose at a licensed waste disposal facility.

If replanting near Sydney Water pipelines refer to '*Which trees can damage wastewater pipes?'* link from Sydney Water website to help identify suitable species.

In TOBAN period:

- For maintenance and construction activities that are not essential/emergency works, the use of fire in the open, including for general purpose hot works must not proceed without an exemption being approved.

Staff and contractors should use the Sydney Water Total Fire Ban Exemption Framework to determine exemption permissibility and approval pathway.

Consult Taronga Zoo's Ben Zerbes (Mobile: 0417 201 180, Email: bzerbes@zoo.nsw.gov.au) prior to the removal of vegetation to determine the usefulness of vegetation waste as koala feed.

Protect Groundwater Dependent Ecosystems by minimising extraction of groundwater and removal of native vegetation.

5.4 Heritage

Aboriginal heritage

An Aboriginal Heritage Due Diligence Assessment (AHDD) was prepared for the proposal (refer to Appendix D). The report assesses the potential impact of the proposal on Aboriginal archaeological heritage. This included a desktop assessment and visual inspection of the construction corridor in March 2025.

Existing environment and potential impact

The proposal has the potential to impact Aboriginal heritage through ground disturbance. A search of Aboriginal Heritage Information Management System (AHIMS) was conducted on 4 April 2025 to identify registered (known) Aboriginal sites or declared Aboriginal places within or adjacent to the construction corridor. AHIMS records show that there are no previously registered sites within or adjacent to the construction corridor.

The AHDD found that contemporary land use has led to high levels of disturbance due to road construction, existing water-related infrastructure, landscaping and installation of utilities. With the implementation of the mitigation measures below, potential impacts to Aboriginal heritage are expected to be low.

Non-Aboriginal heritage

Existing environment

There are several non-Aboriginal heritage listed items within the study area, including cottages, houses and parks. Seven items could potentially be impacted by the proposal, see Table 5-6 and Figure 2-3 to Figure 2-11.

Table 5-6 Non-Aboriginal heritage items within the construction corridor

Heritage item	State heritage number	Ryde Local Environmental Plan 2014/ Canterbury Bankstown Local Environmental Plan 2023	Sydney Water Heritage and Conservation S170
Ryde Pumping Station and site	SHR 01634	I155	WP0005, 4572724
Wahroonga Reservoir	SHR 01352	I974	WS0123, 4575766 WS0124, 4575767
Potts Hill Reservoirs 1 and 2 and site	SHR 01333	I221	4573701
Hermitage Reservoir and associated buildings	NA	329	4575758
Great North Road	NA	54	NA
Northern Suburbs Ocean Outfall Sewer (NSOOS)	NA	NA	4570286
Macquarie University (ruins)	NA	I10	NA

Ryde Pumping Station maintains tangible evidence of the largest pumping station in Australia at the time of its construction. The steep, highly compacted embankment around the suction tank in the northwest corner of the site is an important element in the site's development and dates to the early 1890s. The pumping station continues its original function supplying water to the northern areas of Sydney. The palms on the northern side of the site reflect the character of plantings usually associated with government-related projects. The mature species include the uncommon State Chilean Wine Palm (*Jubaea chilensis*). The site holds scientific value as a reserve for remnant indigenous vegetation.

The Wahroonga Reservoir site demonstrates growth in demand for water supply in the Northern Suburbs from 1898. The reservoirs demonstrate a variety of construction techniques used by the Water Board.

The Potts Hill Reservoir site was an integral part of the Upper Nepean Water Supply Scheme, which allowed for the growth of Sydney from the late nineteenth century. The expansion of the site with the addition of Reservoir 2, represented the growth of the City of Sydney and surrounding suburbs for more than a century.

Built in 1909 and 1910, the Hermitage Reservoirs are examples of riveted steel reservoirs. They served a key role in the distribution of water to the northern suburbs and the amplification of supply to meet the demands of the growing population.

Great North Road is a historically significant convict-built road extending from Sydney to the Hunter. The heritage significance at Ryde is associated with the route and not the fabric or modern characteristics of the road. In present day, North Road at Ryde is a council managed two lane road travelling in both directions.

The Northern Suburbs Ocean Outfall Sewer (NSOOS) was built progressively between 1916 and 1933, and extends from Blacktown and transporting wastewater to the North Head. It was the third major sewerage system built to service Sydney's growing wastewater needs.

The Macquarie University (ruins) are representative of the highpoint of market gardens, orchards and poultry farms located on the Macquarie University campus.

Potential impact

Construction compounds are proposed at Wahroonga, Hermitage and the Potts Hill Reservoir sites. A Sydney Water Heritage Advisor reviewed the works and confirmed they are consistent with the existing operational use of the reservoirs. No exemptions or approvals are required for the proposed works at these sites.

The proposal involves excavation within the heritage curtilage of the Great North Road. As the route of the road will not be affected, the proposal will have no impact on its heritage significance. No exemptions or approvals are required for this heritage item.

The NSOOS is about 7 m underground and may be sensitive to vibration. The proposal falls within the minimum working distances for heritage buildings and structures (refer to Table 20 of Appendix E). A specialist engineering assessment will be performed during detailed design to ensure construction of the proposal does not affect the NSOOS’s structural integrity and heritage values. Further assessment will be required if there is potential impact to the NSOOS.

Although the construction corridor is in the heritage curtilage of Macquarie University (ruins), the ruins are fenced off and located 500 m south of the construction corridor. The proposal would have no impact on the heritage significance. No exemptions or approvals are required for this heritage item.

The proposal involves alterations to delivery pipework and works within the heritage curtilage at Ryde Pumping Station. The works have been designed to avoid impacts to significant heritage fabric. Excavations will be outside of the heritage Chilean Palms tree protection zone (TPZ) along Victoria Ave. The SoHI (Appendix E) confirmed that excavation to install new pipework and connect to the existing pipework is consistent with the heritage significance of the Ryde Pumping Station as an operational facility. The SoHI confirmed that the proposal will not have an adverse impact on the significance of the heritage item. The proposal will comply with the relevant standards and specified activities of Standard Exemptions and Sydney Water State Agency Exemptions (refer to Appendix E). The proposal positively supports the pump station’s heritage significance by enabling ongoing operations.

No impacts to Aboriginal and non-Aboriginal heritage are expected during operation.

Mitigation measures

With the implementation of the mitigation measures below, potential impacts to Aboriginal heritage and non-Aboriginal heritage are assessed as negligible.

Table 5-7 Environmental mitigation measures — heritage

Mitigation measures
Do not make publicly available or publish, in any form, Aboriginal heritage information on sites / potential archaeological deposits, particularly regarding location.
Repeat the basic AHIMS search if it is older than 12 months. Conduct additional assessment if new sites are registered and could be impacted by the works.
A photographic record must be taken prior to alterations and throughout the construction process at the Ryde Pumping Station to document changes. The photographic record must be forwarded to Sydney Water's Heritage Advisor.
If any Aboriginal object or non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify Sydney Water Project Manager in accordance with SWEMS0009.
Sydney Water will prepare a toolbox talk to inform contractors about the heritage significance of the heritage sites in the construction corridor as part of the general site induction package. The induction would identify why the sites are significant, the contractors' statutory obligations relating to heritage and to unexpected finds. It will include protection methods to be used during construction to prevent accidental damage during construction works.
Keep excavations outside of the heritage Chilean Palms TPZ (1 m outside of the crown projection) along Victoria Avenue.
Protect Ryde Pumping Station in the vicinity of the works to prevent accidental damage. Protection measures will include physical barriers, exclusion zones or other methods as appropriate.
Delivery contractor to confirm the sensitivity of heritage buildings and other potentially at-risk structures prior to start of any works. A specialised engineering assessment will be carried out on the NSOOS to avoid impacts to its structural integrity and heritage values. Further assessment will be required if there is potential impact to the NSOOS.

5.5 Noise and vibration

A Noise and Vibration Impact Assessment (NVIA) was prepared for the proposal, using a study area of 500 m from the construction corridor (see Appendix F).

Existing environment

Noise sensitive receivers in the study area include residential, community use, educational, places of worship, recreational, commercial, industrial land uses, parks and bushland.

The NVIA grouped residential receivers into noise catchment areas (NCA) shown in Appendix E, Figures 1-3. Rating background noise levels (RBLs) were derived from background noise monitoring data from nearby projects. Noise management levels (NMLs) were then derived using the RBLs and criteria from the Interim Construction Noise Guideline (ICNG) (DECC NSW, 2009). NMLs represent a threshold for noise impacts to sensitive receivers. All other non-residential sensitive receivers have fixed criteria. Refer to Table 5-8 below.

Table 5-8 NMLs

Type of receiver	Standard Hours dB LAeq(15 min)	Out of hours period 1 - day dB LAeq(15 min)	Out of hours period 1 - evening dB LAeq(15 min)	Out of hours period 2 dB LAeq(15 min)	Highly noise affected (HNA)
Residential – NCA1	55	50	50	44	75
Residential – NCA2A	55	50	45	40	75
Residential – NCA12B	49	44	41	37	75
Residential – NCA3	49	44	44	40	75
Residential – NCA4	48	43	42	34	75
Residential – NCA5	55	50	47	37	75
Residential – NCA6A	48	43	43	43	75
Residential – NCA6B	52	47	47	38	75
Residential – NCA7	57	42	42	37	75
Residential – NCA8	53	48	42	37	75
Residential – NCA9	55	50	48	41	75
Residential – NCA10	47	42	40	33	75
Residential – NCA11	46	41	41	34	75
Residential – NCA12	61	56	53	42	75
Residential – NCA13	55	50	48	43	75
Active recreation	65 when in use				NA
Commercial	65 when in use				NA
Community use	55 when in use				NA
Educational	55 when in use				NA
Health	55 when in use				NA
Industrial	70 when in use				NA
Passive recreation	60 when in use				NA
Place of worship	55 when in use				NA

Notes: 1. Construction hours are extracted from Table 1 of the ICNG [5] **Standard Hours**: Monday – Friday 7:00 am – 6:00 pm, Saturday 8:00 am to 1:00 pm. **Out of hour Period 1 Day:** Saturday 7:00 am – 8:00 am, 1:00 pm to 6:00 pm, Sunday and Public Holiday 8:00 am to 6:00pm. **Out of hour Period 1 Evening**: Monday to Saturday 6:00 pm – 10:00 pm. **Out of hour Period 2**: Monday to Friday 10:00 pm to 7:00 am, Saturday 12:00 am to 7:00 am and 10:00 pm to 12:00 am, Sunday and Public holiday 12:00 am – 8:00 am and 6:00 pm to 12:00 am.

Potential impact

The proposal has the potential to cause noise and vibration impacts from:

- construction activities including open trenching, micro-tunnelling and direct pipe methodology, as well as the use of compounds
- construction traffic
- equipment vibration.

The noise levels experienced at any one location will rise and fall relative to:

- the intensity and location of construction activities
- the intervening terrain or infrastructure
- the type of equipment used.

Construction noise

An acoustic model was prepared based on different scenarios including construction timing, equipment used and methodology. The model predicted expected construction noise levels at each receiver. For assessment purposes, all plant and equipment for each scenario was presumed to be operating concurrently. This is a worst-case assessment as it is unlikely all plant and equipment will be used at once. Also, the assessment has not considered the effect of mufflers or noise barriers to reduce impacts.

Table 5-9 presents the number of sensitive receivers where NMLs are exceeded and are potentially impacted. Appendix F of Appendix E shows the location of potentially impacted receivers.

Table 5-9 Number of sensitive receivers predicted to exceed NMLs (dB)

Compounds				Micro-tunnelling			
Standard hours		Out of hours		Standard hours		Out of hours	
dB	Receivers	dB	Receivers	dB	Receivers		
≤10	2761	≤5	516	≤10	1402	No out of hours work proposed	
>10 to ≤20	623	>5 to ≤15	849	>10 to ≤20	344		
>20	124	>15 to ≤25	186	>20	74		
HNA	46	>25	141	HNA	32		
		HNA	2				
Trenching				**Direct Pipe**			
Standard hours		Out of hours		Standard hours		Out of hours	
dB	Receivers	dB	Receivers	dB	Receivers		
≤10	3639	≤5	1531	≤10	317	No out of hours work proposed	
>10 to ≤20	1727	>5 to ≤15	1966	>10 to ≤20	93		
>20	1343	>15 to ≤25	885	>20	49		
HNA	888	>25	377	HNA	24		
		HNA	137				

Compounds

Compounds will primarily be used for stockpiling and equipment laydown for the duration of construction. Predicted noise impacts are based on the highest impact activities (e.g. site establishment) which will take about 16 weeks across the whole alignment. Some infrequent out of hours tasks, such as pipe deliveries will be needed. The programming of out of hours works will be determined in detailed design. The highest noise impact activities should be undertaken during less sensitive time periods where possible. Site-specific noise mitigation will be considered in the Construction Noise and Vibration Management Plan (CNVMP).

Trenching

Receivers will experience different noise levels from open trenching as plant and equipment move along the water main alignment. The progressive nature of the open trenching (between 10 to 20 m per shift) means that impacts at a given sensitive receiver will be temporary and not for the entire construction duration.

Micro-tunnelling and direct pipe

Although tunnelling activities are mostly below the surface, NML exceedances are likely to occur during construction activities at the direct pipe launch pit and the micro-tunnel launch and receival pits. Micro-tunnelling works will take about 7 weeks (2 weeks for establishment, 3-4 weeks for underboring and 1 week for demobilising). Direct pipe works will take about 15 months (about 3 months for establishment, 9 months for underboring and about 3 months for demobilising). Out of hours work is not required for micro-tunnelling and direct pipe methodology.

Potential impacts from noise can be managed by applying the project-specific management measures in Table 5-10 during community engagement, and the general mitigation measures at the end of this section.

Table 5-10 Project-specific noise management measures

Construction hours	Receiver perception	Above NML	Management measures[1]
Standard hours Mon-Fri: 7am-6pm Sat:8am-1pm	Noticeable	0	-
	Clearly audible	≤10	-
	Moderately intrusive	>10 to ≤20	PN, V
	Highly intrusive	>20	PN, V
OOHW Period 1 (day and evening) Mon-Fri: 6pm-10am Sat:7-8am &1pm-10pm Sun/PH: 8am-6pm	Noticeable	≤5	-
	Clearly audible	>5 to ≤15	PN, RP,DR
	Moderately intrusive	>15 to ≤20	PN, V, SN, RO, RP, DR
	Highly intrusive	>20	PN, V, SN, RO, RP, DR
OOHW Period 2 Mon-Fri: 6pm-10am Sat:7-8am &1pm-10pm	Noticeable	≤5	PN
	Clearly audible	>5 to ≤15	PN, V, SN, RO, RP, DR

Construction hours	Receiver perception	Above NML	Management measures[1]
Sun/PH: 8am-6pm	Moderately intrusive	>15 to ≤25	PN, V, SN, RO, RP, DR
	Highly intrusive	>25	PN, V, SN, RO, RP, DR,AA
All periods	High noise affected (75 dBA)	>=75dBA	PN, V, SN

1. PN – Periodic notification
V – Verification of monitoring
RP – Respite period
SN – Specific notification, individual briefings or phone call
DR – Duration reduction
RO – Project specific respite offer
AA – Alternate accommodation

Construction traffic noise

Movement of plant, equipment and vehicles will generate noise travelling to and from work sites and compounds during construction. Increased noise impacts from construction traffic are likely to be negligible on busier roads.

There is greater potential for traffic noise impacts on local roads, and at night time. An assessment was undertaken based on a worst case scenario of increased construction traffic at night at individual compounds. The assessment was based on 8 vehicle movements per hour, of which about a third were heavy vehicles.

Construction traffic noise is predicted to exceed the night-time criteria of the NSW Road Noise Policy for residential dwellings on local roads by 1 dB(A). Despite this negligible exceedance, we will notify residents and plan traffic movements to minimise impacts where practicable.

Vibration impact

The proposal has the potential to generate vibration from plant and equipment. The minimum working distances in Table 20 of Appendix E show the possibility of vibration impacting buildings and heritage structures or causing a negative human response. The minimum working distances are indicative and vary depending local geotechnical conditions and plant. The most vibratory intensive equipment to be used includes vibratory rollers, hydraulic hammers and the direct pipe TBM.

Buildings within the minimum working distances may experience cosmetic damage. Potential impacts can be mitigated through monitoring and adjusting equipment size or type (see mitigation measures below).

Potential impact to the NSOOS is discussed in Section 5.4. Potential vibration impacts to other heritage structures are not anticipated as they fall outside the minimum working distance.

Sensitive human receivers are within the minimum working distances within which there may be a human response. However, as vibration emissions are intermittent and short-term, negative human response is assessed as unlikely and can be adequately managed by the mitigation measures below.

No operational vibration impacts are expected.

Mitigation measures

With the implementation of the mitigation measures below, impacts to noise and vibration can be adequately managed, and residual impacts are expected to be moderate.

Table 5-11 Environmental mitigation measures — noise and vibration

Mitigation measures
Works must comply with the EPA Interim Construction Noise Guideline (2009). Preferentially schedule work and deliveries during standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturday. Avoid work on Sunday nights or public holidays where possible. Any proposed work outside of standards hours of construction must be justified. All reasonable and feasible noise mitigation measures should be justified, documented and implemented on-site to mitigate noise impacts. If justified, the following hierarchy should be implemented for out of (standard) hours works (OOHW) from most to least preferable. • Saturday afternoons (1pm to 5pm) • Sunday daytime (8am to 6pm) • weekday evening periods (6pm to 10pm) • weekday nights (10pm to 7am) • all other times (e.g. Sunday night).

Incorporate **standard daytime hours noise management safeguards** into the project-specific Construction Noise and Vibration Management Plan (CNVMP), including but not limited to:
• Implement a noise complaints handling procedure. Complaints will be managed in accordance with Sydney Water's Complaints Procedure and relevant Community Engagement Plan.
• Do not warm-up plant or machinery near residential dwellings before the nominated working hours.
• Select appropriate plant for each task to minimise noise impact (e.g. all stationary and mobile plant will be fitted with residential type silencers and damped hammers such as "City" Model Rammer Hammers).
• Noise levels of plant and equipment items are to be considered in rental decisions.
• Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant.
• Regularly inspect and maintain equipment in good working order.
• Arrange work sites where possible to minimise noise (e.g. generators away from sensitive receivers, site set up to minimise use of vehicle reversing alarms, site amenities and/ or entrances away from noise sensitive receivers).
• Use natural landforms/ mounds or site sheds as noise barriers.
• Schedule noisy activities around times of surrounding high background noise (local road traffic or when other noise sources are active).
• Estimate the likely levels of noise and the scheduling of activities
• Manage roles and responsibilities.
• Identify noise and vibration sensitive receiver locations and structures.
• Include a mitigation and management strategy.
• Monitoring methodology (as relevant).
• Prepare a community engagement strategy.
• Plan traffic flow, parking and loading/unloading areas to minimise reversing movements and idling traffic within the site and before entering site.
  ○ route heavy vehicle movements on major arterial roads and highways away from noise sensitive areas where possible
  ○ provide driver training to minimise loud noise generating vehicle behaviour and to avoid engine compression braking near sensitive receivers.

As works **beyond standard daytime hours are needed**, the delivery contractor would consider: • potential noise impacts and implement the relevant standard daytime hours safeguards, follow Sydney Water's Noise Management Code of Behaviour (SWEMS0056.01) and document all reasonable and feasible management measures e.g. avoid the use of radios or stereos outdoors, avoid shouting and minimise talking loudly and slamming vehicle doors. • schedule highest noise generating activities for the least sensitive times, where practicable (e.g. heavy vehicle movements should be limited to daytime hours)

Mitigation measures
• the acceptability for any out-of-hours works should be confirmed with authorities (e.g. delivery of oversized items, where road closures are required or for emergency works) • for approved out of hours works, noisy activities should be scheduled early in the night to minimise the impact on adjacent residents where feasible • noise barriers (e.g. noise curtains or hoarding) for noisy works where sensitive receivers are predicted to be highly affected for extended periods of time.
The anticipated project-specific community mitigation measures are in Table 5-10 above. They should be reviewed and refined closer to construction and documented in the CNVMP. Community consultation should occur for sensitive receivers who experience exceedances in noise management levels (NML) as follows: • Prior to and during works, notify affected receivers (e.g. letterbox drops, individual briefings or phone calls) with details such as the works purpose, duration, expected impacts and mitigation measures, complaints procedure. • Discuss atypical sensitivities and potential mitigation measures (e.g. vibration sensitive equipment/processes in medical establishments, exam periods or school holidays for education establishments). • Establish long-term personnel or processes (e.g. project email, phone number) to centralise project enquiries.
All employees, contractors, and subcontractors to receive an environmental induction which should include: • standard noise and vibration mitigation measures • permissible hours of work • limitations on high noise and vibration generating activities • location of nearest sensitive receivers • regularly train workers and contractors (such as at toolbox talks) to ensure good work practices to minimise noise.
Select equipment to minimise vibration. Where nearby buildings/structures are located within the safe working distance, pre-construction surveys should be conducted in advance of construction to inform management measures.
Conduct long-term vibration monitoring for vibration generating activities that exceed criteria for Cosmetic Damage in the Construction Noise and Vibration Guideline (TfNSW 2024). Implement measures to reduce vibration if real-time exceedance alerts are triggered, such as: • re-evaluate vibration criterion based on initial condition structure • maintain vibration monitoring throughout works within 'minimum working distances' • reduce the size of demolition and construction equipment and develop alternative methodologies • balance variable speed vibrating plant and operate at speeds that do not produce resonance.
Where vibration from tunnelling activities are considered excessive, operate at a slower speed (considering potential implications for extending the construction period).
Conduct a dilapidation survey / asset condition assessment prior to works which have potential to damage existing structures.
Monitor compliance with the recommended vibration levels in DIN 4150-3 1999: Structural Vibration – Part 3; Effects of vibration on structures.

5.6 Air and energy

Potential impact

The proposal is in residential areas, mixed use and recreational areas. Potential sensitive receivers include residential properties, local businesses and recreational users of LCNP.

The proposal could potentially impact air quality and energy use through:

- emissions from machinery, equipment and vehicles used during construction
- dust generated by construction
- fuel used to power equipment.

Vehicle and equipment emissions have the potential to cause impacts where they are in place for longer, such as pits and compounds. By implementing the mitigation measures such as maintaining vehicles and switching off equipment when not in use, impacts are expected to be minor.

There is potential for dust impacts however, open trenched and disturbed areas will be progressively backfilled. Standard mitigation measures such as dust suppression and covering loads will further reduce potential impacts. Tunnel boring slurry has the potential to generate odour if poorly managed. The slurry will be managed under a waste management plan and regularly taken off site (see also Section 5.7). Other project activities are not expected to generate odour.

No impacts to air or energy are expected during operation.

Mitigation measures

With the implementation of the mitigation measures below, impacts to air and energy can be adequately managed, and residual impacts are expected to be minor.

Table 5-12 Environmental mitigation measures — air and energy

Mitigation measures
Use alternatives to fossil fuels where practical and cost-effective.
Track energy use as per SWEMS0015.28 Contractor NGER template.
Maintain equipment in good working order, comply with the clean air regulations of the *Protection of the Environment Operations Act 1997*, have appropriate exhaust pollution controls, and meet Australian Standards for exhaust emissions.
Switch off vehicles/machinery when not in use.
Implement measures to prevent offsite dust impacts, for example: • Water exposed areas (using non-potable water source where possible such as water from excavation pits). • Cover exposed areas with tarpaulins or geotextile fabric. • Modify or cease work in windy conditions. • Modify site layout (place stockpiles away from sensitive receivers). • Vegetate exposed areas using appropriate seeding.
Cover all transported waste.

5.7 Waste and hazardous materials

Existing environment and potential environmental impact

Sydney Water's corporate objectives include to be a resource recovery business with an increasing portfolio of circular economy products and services. This includes reducing waste through recycling and re-use and encouraging suppliers to minimise wastes. The delivery contractor will manage materials in accordance with the 'avoid and reduce, reuse, recycle, recover, recover energy, treat and dispose' waste hierarchy. This will be documented in the Waste Management Plan in the CEMP.

Potential contamination sources in the construction corridor include:

- fill material from road construction
- hazardous materials at West Ryde Pump Station and Wahroonga Reservoir.

The proposal will generate waste from:

- vegetation trimming and clearing
- drilling fluid
- construction material that can't be re-used such as the exhumed pipes and fittings.

During construction, the largest volume of waste generated by construction is excess spoil from excavations. Wherever possible, suitable excavated spoil will be re-used on site for backfilling and other uses. If the spoil can't be reused it will be tested and classified according to the Waste Classification Guidelines (NSW EPA, 2014) and disposed of at an appropriately licensed facility. Soil will be temporarily stockpiled within the construction corridor before offsite disposal. Detailed site investigation (Aurecon, ARUP 2024) sampling confirmed that spoil was likely to meet the criteria for general solid waste or excavated natural material. This will be confirmed by additional sampling and analysis of excavated material during construction.

The following hazardous materials have been identified at West Ryde Pump Station and Wahroonga Reservoir:

- West Ryde Pumping Station
  - lead paint
  - asbestos containing material (ACM)
  - polychlorinated biphenyl.
- Wahroonga Reservoir
  - lead paint
  - ACM.

The construction corridor does not intersect with the known hazardous material locations. Should the work uncover asbestos or any other hazardous or contaminated material, it will be managed through an unexpected finds procedure.

Green waste that can't be re-used on site will be disposed offsite. Drilling fluids will be circulated through the trenchless section and then screened to remove drill cuttings and reused. Any waste drill cuttings and drilling fluid will be tested, classified, treated and disposed of appropriately. Where the existing RP03 pipe and fitting is exhumed, this will be classified and disposed of.

No operational impacts from waste and hazardous materials are expected.

Mitigation measures

With the implementation of the mitigation measures below, impacts to waste and hazardous materials can be adequately managed, and residual impacts are expected to be minor.

Table 5-13 Environmental mitigation measures — waste and hazardous materials

Mitigation measures
Prepare a Waste and Resource Recovery Plan (WRRP) to appropriately manage and classify any materials including soils, construction/demolition wastes and associated stockpiles The plan will be prepared by the delivery contractor (or nominated environmental consultant) and approved by the Sydney Water Project Manager in consultation with the Environmental Representative and Contamination and Hazardous Material Team The WRRP should include: • expected waste types and their location • delineation of waste /resource types including identification of likely vertical and lateral extents (where warranted) • visual monitoring of materials during excavation and measures to be undertaken to prevent co-mingling / cross-contamination of waste / resource types • ex-situ waste and resource recovery classification program, including timing relative to project / excavation phases as well as proposed hold points • waste minimisation and resource recovery methodologies (including consideration of onsite reuse or management if contaminated) • roles and responsibilities in relation to stockpile and material management and monitoring program • proposed onsite reuse locations and reuse methodology (if applicable) • proposed offsite reuse, offsite recycling and / or offsite disposal locations / facilities • legislative compliance requirements • consideration of future maintenance • site restoration.
Stop work in the immediate vicinity of suspected contamination. Indicators of contamination include discoloured soil, anthropogenic material within fill, asbestos, chemical or petrol odours and leachate. Contain disturbed material on an impermeable surface and cordon areas off. Notify the Sydney Water Project Manager and the Environmental Representative (who will contact Contamination and Hazardous Material team) to agree on proposed management approach.
If contaminated materials are found, a construction Contamination Management Plan must be prepared by a suitably qualified person as part of the CEMP and reviewed by Sydney Water's Environmental Representative in consultation with Contamination and Hazardous Material team. The plan must identify the type and location of known/potential contamination, land-owner notification, management requirements (waste minimisation, waste segregation and classification) and reuse, offsite recycling and/or disposal measures.
Manage waste in accordance with relevant legislation and maintain records to show compliance e.g. waste register, transport and disposal records. Record and submit SWEMS0015.27 Contractor Waste Report.
Provide adequate bins for general waste, hazardous waste and recyclable materials.
Minimise the generation of waste and sort waste streams to maximise reuse/recycling in accordance with the legislative requirements.
Manage waste and excess spoil in accordance with the NSW EPA Resource Recovery Orders and Exemptions (if applicable) and / or Waste Classification Guidelines. Where materials are not suitable or cannot be reused onsite or offsite, recycle where appropriate. Recycle soils at a licensed soil recycling facility or dispose at an appropriately licenced landfill facility.

Mitigation measures
Prevent pollutants from escaping including by covering skip bins.
Dispose excess vegetation (non-weed) that cannot be used for site stabilisation at an appropriate green waste disposal facility.
If fibro or other asbestos containing material is identified, restrict access and follow Sydney Water's Asbestos Management – Minor Works procedure, Document Number 746607 and SafeWork NSW requirements. Contact Sydney Water Project Manager (who will consult with Contamination and Hazardous Material team propertyenvironmental@sydneywater.com.au).
Manage lead paint in accordance with the WHS Regulation (2017) Part 7.2 and the Australian Standard Lead Paint Management Guidelines. Consult with Contamination and Hazardous Material team where works involve removal of lead-based paint. Develop a Lead Management Plan if required.
Review existing hazardous building materials (HBM) report and implement relevant safeguards. Conduct hazardous materials survey prior to commencement where works could impact hazardous materials not surveyed in previous HBM assessments.

5.8 Traffic and access

Existing environment

Most of the proposal is on local roads in residential and mixed-use areas, with some crossings beneath or running adjacent to several classified roads including:

- State roads - Victoria Road, Pacific Highway, M2 Motorway, Epping Road
- Regional roads - Balaclava Road, Kissing Point Road, Comenarra Parkway.

There are several bus stops on the streets in the study area. These service the following bus routes:

- 292 Lane Cove to Macquarie Park
- 293 Wynyard to Marsfield
- 551 Marsfield to Eastwood
- 500X Hyde Park to West Ryde
- 515 Ryde to Eastwood
- 517 Ryde to Macquarie Park
- 518 Meadowbank to Macquarie University
- 544 Macquarie Centre to Auburn
- 545 Macquarie Park to Parramatta
- 571 Turramurra to South Turramurra
- 572 Macquarie University to Turramurra
- 573 Turramurra to Sydney Adventist Hospital.

There is a formal walkway at the northern point of Vimera Road at the M2 crossing. This is used by pedestrians and cyclists to access LCNP. LCNP can also be accessed from Kissing Point Road via the BSA BA00132 site. Most local streets have formal pedestrian footpaths. There are limited cycling lanes across the construction corridor.

Potential impact

Activities with the potential to impact traffic, transport and access include:

- movement of workers, plant, equipment, and vehicles
- construction activities (such as compound use, trenching, laydown areas)
- construction worker parking
- mechanical issues with the drill head during direct pipe and micro-tunnelling.

The proposal requires about 108 heavy vehicle movements and 204 light vehicle movements per day. This will vary depending on work staging along the proposal alignment. Heavy vehicles will transport material and equipment. Equipment, such as excavators, will be moving within the construction corridor. The construction corridor will mostly be accessed via existing local roads. Temporary road closures and bus stop relocation may be required during construction where open trenching and/or pit excavation is required within the roadway.

Local councils and Transport for NSW will be consulted to approve traffic management plans (TMPs) or obtain any ROLs. Sydney Water has consulted with council as required by the TISEPP for any impacts on roads where council is the roads authority (see Section 3.3).

Construction will be staged to maintain traffic flow as far as reasonably practicable. Construction worker vehicles will be parked within the construction corridor or local roads in available parking spaces where possible. Traffic, parking and plant movements will be managed in accordance with the proposed mitigation measures and are unlikely to have more than a minor impact on parking availability and property access.

Construction sites will be managed to ensure that pedestrians and cyclists can pass safely around construction sites. Access to LCNP will be maintained at all times and the potential to impact recreational users of LCNP is low. The receival shaft will occupy land managed by Council. This, and other areas along the alignment will be temporarily inaccessible during construction. We will reinstate the area to pre-existing conditions or better after construction is finished.

As the proposal is below ground there are no traffic or access impacts expected during operation.

Mitigation measures

With the implementation of the mitigation measures below, potential construction and operation impacts to traffic and access can be adequately managed. Residual impacts are expected to be moderate.

Table 5-14 Environmental mitigation measures — traffic and access

Mitigation measures
Prepare a TMP in consultation with the relevant traffic authority. Meet NSW Roads and Maritime Service's Traffic Control at Worksites Manual v5 requirements for TfNSW roads. The delivery contractor will obtain a Road Occupancy Licence (ROL) from TfNSW, including if works are within 100m of traffic signals when construction commences.
Develop management measure to minimise traffic impacts near residential properties, schools and businesses by consulting with them (e.g. no major materials deliveries at school drop off or pick up times etc).
Consult with the relevant traffic authority about managing impacts to pedestrian traffic, signposting, meters, parking, line-marking or if traffic control or pavement restoration is required.
Erect signs to inform road users of the proposed works and any temporary road closures.
Manage sites to allow people to move safely past the works, including alternative pedestrian, bicycle, pram and wheelchair access. Access to LCNP will be maintained at all times.

Mitigation measures

Ensure work vehicles do not obstruct vehicular or pedestrian traffic, or private driveway, public facility or business access unless necessary and only if appropriate notification has been provided.

5.9 Social and visual

Existing environment

The existing environment in the study area includes the largely residential suburbs of West Ryde, Ryde, Marsfield, South Turramurra, Turramurra and Wahroonga. Future changes anticipated for the area include employment, industry, and higher density residential growth. The study area includes LCNP and smaller parks and reserves (see Figure 2-3 to Figure 2-11).

Potential impact

The potential social impacts from noise, vibration, traffic, air quality and access are considered in the sections above. During construction, there may be temporary impacts to visual amenity for surrounding receivers through the increased presence of heavy equipment, machinery and vehicles. Construction activities and site compounds may be visible from residences adjacent to the proposal. Trenching will move progressively along the alignment, with disturbed areas backfilled and rehabilitated in consultation with landowners.

While some vegetation clearing is required, the proposal has been designed to minimise clearing as far as practicable. A minor and temporary visual impact may be experienced due to vegetation removal in some locations. We will offset vegetation removal impacts in accordance with the mitigation measures in Section 5.3.

During operation, potential visual impact is negligible as the proposal is below ground.

Mitigation measures

With the implementation of the mitigation measures below, impacts to social and visual amenity can be adequately managed, and residual construction impacts are expected to be minor.

Table 5-15 Environmental mitigation measures — social and visual

Mitigation measures
Undertake works in accordance with Sydney Water Communications policies and requirements including: • Notify impacted residents and businesses. • Erect signs to inform the public on nature of work. • Treat community enquiries appropriately.
Restore work sites to pre-existing condition or better.
Direct artificial light away from sensitive receivers where possible (ie residents, fauna or roadways).
Minimise visual impacts (e.g. retain existing vegetation where possible).
No smoking within National Parks.
Maintain work areas in a clean and tidy condition.

5.10 Cumulative and future trends

Potential impact

A search of the NSW Department of Planning Housing and Infrastructure major projects website in July 2025 identified several projects in the Ryde and Ku-ring Gai LGAs including:

- several new school modifications, redevelopments and expansions
- industrial estates, business hubs, warehouse, distribution centres, data centres and resource recovery facilities
- residential developments.

During construction, the main potential cumulative impacts of the proposal and the above projects relate to noise, biodiversity and traffic.

The potential for cumulative noise impacts is dependent on the specific activities carried out simultaneously close to sensitive receivers. During trenching, the works move along the alignment, and the potential for significant cumulative noise impacts is likely to be low.

There is increased potential for cumulative impacts where the proposal is in one location for longer, such as compounds and pits. Through effective community consultation and coordination with nearby projects, potential impacts can be managed by mitigation measures in this section and Section 5.5.

Biodiversity impacts have been minimised where practicable through design development, and as impacts will be offset, potential cumulative impacts are assessed as low.

The proposal will generate increased construction traffic. The potential to generate cumulative impacts is lower on local roads and where the works move progressively along the alignment. The risk of cumulative impacts increases for compounds and pits as they are occupied for longer, and especially where construction traffic is on local roads. Sydney Water and the delivery contractor will consult with other developments to minimise the potential for cumulative impacts where practicable through construction planning. Impacts will be managed in accordance with the mitigation measures proposed in this section and Section 5.8.

Multiple Sydney Water owned sites will be used as construction compounds. Potential cumulative impacts will be mitigated by coordination between the Sydney Water project teams.

A check of the council development application websites on 23 July and 23 September 2025 did not identify any developments close to the compounds and pits. Once staging of works along the alignment is known, the websites can be checked for developments with the potential to cause cumulative impacts. The delivery contractor will coordinate works with ongoing or proposed developments and Ryde City and Ku-ring Gai Councils to mitigate impacts if required.

No cumulative impacts during operation are expected.

Future trends

Climate change is predicted to cause:

- higher temperatures
- decreased annual rainfall
- longer dry periods and more extreme weather events such as high intensity storms and bushfires.

Increased frequency and/or severity of bushfires, flooding and extreme storm events are unlikely to impact the proposal, as the assets are underground and outside the 1% AEP flood level. Further assessment will be carried out in detailed design and construction in line with Sydney Water's Climate Change Adaption Position Statement. The proposal will help provide a more reliable water supply that will help support any change in water demand because of these trends.

The proposal has the potential to exacerbate future trends through hot work causing bushfires and greenhouse gas (GHG) emissions from fossil fuel use. Bushfire risk will be mitigated through standard safety mitigation measures (see Table 5-5). GHG emissions have been assessed throughout concept design, using the Sydney Water GHG Estimation Tool. Key considerations and mitigations measures to reduce the carbon footprint of the proposal include construction methodology, pipe material types and alignment. Upfront emissions reductions opportunities will be further explored throughout detailed design and construction procurement.

During operation, the proposal is not expected to exacerbate future trends.

Mitigation measures

With the implementation of the proposed mitigation measures, cumulative and future trends impacts can be adequately managed, and residual impacts are expected to be minor.

Table 5-16 Environmental mitigation measures — cumulative and future trends

Mitigation measures
Delivery contractor to check council development application websites once work staging is known. Coordinate works with other ongoing or proposed developments will be required to minimise negative impacts or conflicts with construction scheduling.
Deliveries and parking to occur within the proposal area to reduce potential cumulative road impacts to the local road network where possible.
Coordinate proposal with other Sydney Water project teams on operational sites.
An assessment will be carried out in detailed design and construction in line with Sydney Water's Climate Change Adaption Position Statement including emissions reduction opportunities.

5.11 General environmental management

Table 5-17 Environmental mitigation measures — general environmental management

Mitigation measures
Sydney Water's Project Manager (after consultation with the environmental and community representatives and affected landowners) can approve temporary ancillary construction facilities (such as compounds and access tracks), without additional environmental assessment or approval if the facilities: • limit proximity to sensitive receivers • do not disrupt property access • have no impact to known items of non-Aboriginal and Aboriginal heritage • are outside high risk areas for Aboriginal heritage • use existing cleared areas and existing access tracks • have no impacts to remnant native vegetation or key habitat features • have no disturbance to waterways • do not require additional safeguards beyond those included in the EIA • do not disturb contaminated land or acid sulfate soils • will be rehabilitated at the end of construction. The delivery contractor must demonstrate in writing how the proposed ancillary facilities meet these principles. Any facilities that do not meet these principles will require additional environmental impact assessment. The agreed location of these facilities must be shown on the CEMP site plan and appropriate environmental controls installed.
The delivery contractor will conduct pre-mobilisation and post-demobilisation soil sampling on compound sites to confirm no residual impacts.
Should the proposal change from the EIA, no further environmental assessment is required provided the change: • remains within the construction corridor for the REF and has no net additional environmental impact or • is outside the construction corridor for the REF but: - reduces impacts to biodiversity, heritage or human amenity or - avoids engineering (for example, geological, topographical) constraints and - after consultation with any potentially affected landowners and relevant agencies. The delivery contractor must demonstrate in writing how the changes meet these requirements, for approval by Sydney Water's Project Manager in consultation with the environmental and community representatives.
Prepare a Construction Environmental Management Plan (CEMP) addressing the requirements of this environmental assessment. The CEMP should identify licence, approval and notification requirements. Prior to the start of work, all project staff and contractors will be inducted in the CEMP. The CEMP must be readily available on site and include a site plan which shows: • go/no go areas and boundaries of the work area • location of environmental controls (including erosion and sediment controls, any fences or other measures to protect vegetation or fauna, spill kits, stockpile areas) • location and full extent of any vegetation disturbance.
Sydney Water's Project Manager (after consultation with the environmental and community representatives and affected landowners) can approve temporary ancillary construction facilities (such as compounds and access tracks), without additional environmental assessment or approval if the facilities: • limit proximity to sensitive receivers • do not disrupt property access • have no impact to known items of non-Aboriginal and Aboriginal heritage • are outside high risk areas for Aboriginal heritage • use existing cleared areas and existing access tracks • have no impacts to remnant native vegetation or key habitat features • have no disturbance to waterways • do not require additional safeguards beyond those included in the EIA • do not disturb contaminated land or acid sulfate soils • will be rehabilitated at the end of construction.

The delivery contractor must demonstrate in writing how the proposed ancillary facilities meet these principles. Any facilities that do not meet these principles will require additional environmental impact assessment.

The agreed location of these facilities must be shown on the CEMP site plan and appropriate environmental controls installed.

Prepare an Incident Management Plan (IMP) outlining actions and responsibilities for:

- predicted/onset of heavy rain during works
- spills
- unexpected finds (e.g.heritage and contamination)
- other potential incidents relevant to the scope of works.

All site personnel must be inducted into the IMP.

To ensure compliance with legislative requirements for incident management (e.g.*Protection of the Environment Operations Act 1997)*, Follow SWEMS0009 and attach SWEMS0009 to the CEMP.

Assign single person with accountability for coordinating communication and information flow across contractors and consultants and provide the contact details of this person in the EWMS and/or CEMP.

6. Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of Ryde to Pymble pipeline upgrade. The proposal is required to:

- increase drinking water supply infrastructure to cater for growth
- increase drinking water resilience by providing a contingency supply from the Ryde System.

The main potential construction environmental impacts of the proposal include amenity impacts from noise and vibration, traffic and impacts to biodiversity. During operation, no impacts are expected. Given the nature, scale and extent of impacts and implementation of the mitigation measures outlined in this REF, the proposal is unlikely to have a significant impact on the environment. Therefore, an environmental impact statement is not required under Division 5.1 of the EP&A Act.

The REF considers how the proposal aligns with the principles of ESD. The proposal will not result in the degradation of the quality of the environment and will not pose a risk to the safety of the environment.

References

Aurecon Arup, 2024. Ryde to Pymble Main No.3 Reinstatement – Detailed Site Investigation, June 2024.

Department of Planning and Environment (DPE), 2022. Greater Sydney Water Strategy, August 2022.

EPA (NSW Environment Protection Authority) (2020) *Draft Construction Noise Guideline*, EPA website, accessed 18 July 2025.

Greater Sydney Commission, 2018. Greater Sydney Region Plan—A Metropolis of Three Cities, March 2018.

Infrastructure NSW, 2022. Staying Ahead: State Infrastructure Strategy (current version: 2022- 2042), May 2022

KBR (Kellogg Brown and Root) 2025. – Lane Cove River Crossing Ground ConditionsTechnical Memorandum 2025.

Appendices

Appendix A – Section 171 and 171A checklist

Section 171 of the EP&A Regulation requires a determining authority to take into account the environmental factors specified in the environmental factors guidelines that apply to an activity (a proposal). The *Guidelines for Division 5.1 Assessments* (DPIE, 2022) are applicable guidelines for the proposal. Section 3 of the guidelines identifies the environmental factors to be considered, which refers to and lists the factors in section 171(2) of the EP&A Regulation.

These environmental factors are listed below in Table A1 below, along with the corresponding findings of the REF.

Table A1 Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	There will be impacts on the community from noise and vibration, traffic and impacts from vegetation clearing. Potential impacts will be managed in accordance with the mitigation measures listed in Section 5. During operation, no additional impacts are expected. There will be environmental improvements by supplying a resilient drinking water service to the community.
Any transformation of a locality	There are temporary and minor locality changes during construction. The proposal will not result in the transformation of a locality during operation, as the water main will be below ground.
Any environmental impact on the ecosystems of the locality	The proposal will result in minor environmental impacts to ecosystems of the locality as vegetation clearing is required. These impacts will be offset in accordance with the Sydney Water Biodiversity Offset Guideline.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	There are temporary and minor reductions in aesthetic and recreational factors during construction. However, there are no permanent changes as the water main will be below ground.
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	The proposal will not have any effect on these matters. Impacts to the known heritage items within the construction corridor are considered negligible. Applying the recommended mitigation measures will ensure potential impacts to the heritage values are avoided.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposal will result in the removal of some habitat of protected animals, however it will not result in a significant impact to any of the threatened species within the construction corridor. Mitigation measures, including biodiversity offsets have been identified to avoid or minimise impacts on habitat areas.

Section 171 checklist	REF finding
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	The proposal will not endanger any species. Assessments of significance concluded that the proposal is unlikely to significantly impact TECs and threatened fauna species (refer to Appendix C).
Any long-term effects on the environment	The proposal will not have any long-term adverse effects on the environment. It will enable a long-term benefit by providing a reliable drinking water service to support predicted population growth.
Any degradation of the quality of the environment	There will be minor and temporary degradation of the social and ecological quality of the environment through visual impacts and vegetation removal. Vegetation removal has been minimised to help retain areas of higher quality vegetation.
Any risk to the safety of the environment	The proposal will not increase risk to the safety of the environment. It is not expected to be impacted by, or impact, future trends such as flooding and bushfire.
Any reduction in the range of beneficial uses of the environment	During construction there may be some temporary reduction in the range of beneficial uses of the environment such as temporary closures of public areas. There will be no reduction of beneficial uses during operation.
Any pollution of the environment	The proposal will generate noise pollution. Environmental mitigation measures will mitigate potential impacts and no other pollution is expected.
Any environmental problems associated with the disposal of waste	Waste disposal will be in accordance with the environmental mitigation measures, and no environmental problems associated with the disposal of waste are expected.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposal will not increase demand on these resources.
Any cumulative environmental effect with other existing or likely future activities	The proposal will have potential cumulative impacts related to noise, biodiversity and traffic. The degree of impact will be dependent on the design and programming of the other projects. Any potential impacts will be managed in accordance with mitigation measures in Section 5.10 of the REF.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The proposal will not have any impact on these factors.
Any applicable local strategic planning statements, regional	The proposal considered the applicable strategic plans including:

Section 171 checklist	REF finding
strategic plans or district strategic plans made under the EP&A Act, Division 3.1	• Greater Sydney Region Plan—A Metropolis of Three Cities, Greater Sydney Commission, 2018 This regional strategic plan aims to respond to the needs of Greater Sydney's people and the region's current and future structural challenges. The proposal is consistent with this strategy as it will help meet Greater Sydney's drinking water needs. • State Infrastructure Strategy, 2022 The proposal is consistent with this strategy, such as to 'Embed reliability and resilience' and 'Enhance long term water supply'. • Greater Sydney Water Strategy, 2022 The proposal is consistent with this strategy as it will 'Invest in upgrades, new connections and leak management to address the risks posed by ageing water and wastewater systems and infrastructure'. Ryde and Ku-ring-gai Councils issued Local Strategic Planning Statements (LSPS) consistent with the above. The LSPS include 20-year plans setting out Councils' vision and planning priorities for each LGA, and outline the actions Council will take to achieve them. Both Councils have identified the need to plan for the future and consider what infrastructure is required to support projected growth.
Any other relevant environmental factors.	The proposal has been assessed against the factors listed above, and there are no other relevant environmental factors to consider.

Section 171A of the EP&A Regulation requires a determining authority to take into account the matters a consent authority must consider under Part 6.2 of the BCSEPP for a proposal within a 'regulated catchment'. As the proposal is within the Hawkesbury-Nepean and Sydney Drinking Water catchments, the requirements of Section 171A(1) are applicable and are considered in Table A2 below.

Table A2 Section 171A checklist

Section 171A checklist (Development in regulated catchments)	REF finding
BCSEPP – Section 6.6(1) - Water quality and quantity In deciding whether to grant development consent to development on land in a regulated catchment, the consent authority must consider the following:	
(a) whether the development will have a neutral or beneficial effect on the quality of water entering a waterway	Mitigation measures will be implemented during construction to ensure that the proposal has a neutral impact on the quality of water entering waterways.

Section 171A checklist (Development in regulated catchments)	REF finding
(b) whether the development will have an adverse impact on water flow in a natural waterbody	The proposal will not modify or adversely affect water flows in the regulated catchments during construction or operation.
(c) whether the development will increase the amount of stormwater run-off from a site	The proposal will not increase the area of impervious surfaces. The final landform will ensure that the proposal will not increase the volume of stormwater run-off from the site.
(d) whether the development will incorporate on-site stormwater retention, infiltration or reuse	The water main will act as a closed system and will not increase the area of impervious surfaces. Provision for on-site stormwater retention, infiltration or reuse is not required.
(e) the impact of the development on the level and quality of the water table	Trenched and underbored sections of the proposal may encounter groundwater during construction, however, impacts to groundwater levels and quality are expected to be negligible.
(f) the cumulative environmental impact of the development on the regulated catchment	The proposal addresses the need to increase drinking water supply infrastructure to cater for growth. By implementing environmental mitigation measures in section 5, the potential for cumulative impacts between the proposal and other projects within the catchments is low.
(g) whether the development makes adequate provision to protect the quality and quantity of ground water.	Impacts to the level and quality of the groundwater are expected to be negligible (see 6.6(1)(e) above).
BCSEPP – Section 6.6(2) - Water quality and quantity Development consent must not be granted to development on land in a regulated catchment unless the consent authority is satisfied the development ensures:	
(a) the effect on the quality of water entering a natural waterbody will be as close as possible to neutral or beneficial	Mitigation measures are included in Table 5-1 and Table 5-2 to ensure that the proposal will have a neutral or beneficial effect on the water quality of regulated catchments.
(b) the impact on water flow in a natural waterbody will be minimised	The proposal will not modify or adversely affect water flows within the regulated catchments during construction or operation.

Section 171A checklist (Development in regulated catchments)	REF finding
BCSEPP – Section 6.7(1) - Aquatic Ecology	
In deciding whether to grant development consent to development on land in a regulated catchment, the consent authority must consider the following:	
(a) whether the development will have a direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation	The proposal requires trimming and tree removal within the construction corridor. Direct, indirect or cumulative adverse impacts to terrestrial, aquatic or migratory animals or vegetation of the locality will be minor. Vegetation removal will be offset.
(b) whether the development involves the clearing of riparian vegetation and, if so, whether the development will require: (i) a controlled activity approval under the *Water Management Act 2000*, or (ii) a permit under the *Fisheries Management Act 1994*	Clearing is required in the riparian zone. These impacts will be offset in accordance with the Sydney Water Biodiversity Offset Guideline. Sydney Water is exempt from the need to obtain a controlled activity approval under the *Water Management Act 2000.* A permit under the *Fisheries Management Act 1994* is not required for the proposal.
(c) whether the development will minimise or avoid: (i) the erosion of land abutting a natural waterbody, or (ii) the sedimentation of a natural waterbody	Mitigation measures to minimise and avoid the potential for erosion and sedimentation impacts to these areas within the regulated catchments are included in Table 5-1 and Table 5-2.
(d) whether the development will have an adverse impact on wetlands that are not in the coastal wetlands and littoral rainforests area	There are no wetlands close to the construction corridor.
(e) whether the development includes adequate safeguards and rehabilitation measures to protect aquatic ecology	Mitigation measures to protect aquatic ecology within the regulated catchments are included in Table 5-1 and Table 5-2.
(f) if the development site adjoins a natural waterbody, whether additional measures are required to ensure a neutral or beneficial effect on the water quality of the waterbody	Appropriate mitigation measures are included in Table 5-1 and Table 5-2 to ensure that the proposal will have a neutral or beneficial effect on water quality within the regulated catchments.
BCSEPP – Section 6.7(2) - Aquatic Ecology Development consent must not be granted to development on land in a regulated catchment unless the consent authority is satisfied of the following:	

Section 171A checklist (Development in regulated catchments)	REF finding
(a) the direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation will be kept to the minimum necessary for the carrying out of the development	Appropriate mitigation measures are included in Table 5-1, Table 5-2 and Table 5-5 to ensure that impacts on terrestrial, aquatic or migratory animals or vegetation are limited to the minimum extent necessary.
(b) the development will not have a direct, indirect or cumulative adverse impact on aquatic reserves	There are no aquatic reserves close to the proposal.
(c) if a controlled activity approval under the *Water Management Act 2000* or a permit under the *Fisheries Management Act 1994* is required in relation to the clearing of riparian vegetation—the approval or permit has been obtained	Sydney Water is exempt from the need to obtain a controlled activity approval under the *Water Management Act 2000*. A permit under the *Fisheries Management Act 1994* is not required for the proposal.
(d) the erosion of land abutting a natural waterbody or the sedimentation of a natural waterbody will be minimised	Mitigation measures to minimise the potential for erosion and sedimentation impacts to these areas within the regulated catchments are included in Table 5-1 and Table 5-2.
(e) the adverse impact on wetlands that are not in the coastal wetlands and littoral rainforests area will be minimised	There are no wetlands close to the construction corridor.
BCSEPP – Section 6.8(1) – Flooding	
In deciding whether to grant development consent to development on land in a regulated catchment, the consent authority must consider the likely impact of the development on periodic flooding that benefits wetlands and other riverine ecosystems	The water main will be below ground. The proposal is outside the 1% AEP event and will not have adverse impacts on beneficial flooding events.
BCSEPP – Section 6.8(2) – Flooding Development consent must not be granted to development on flood liable land in a regulated catchment unless the consent authority is satisfied the development will not:	
(a) if there is a flood, result in a release of pollutants that may have an adverse impact on the water quality of a natural waterbody, or	The proposal is outside the 1% AEP event and the water main will be below ground. Mitigation measures to minimise the potential for erosion and sedimentation and potential contamination impacts in the regulated catchments are included in Table 5-1 and Table 5-2.
(b) have an adverse impact on the natural recession of floodwaters into wetlands and other riverine ecosystems	The proposal is outside the 1% AEP event and the water main will be below ground. The proposal will not alter the existing contours of

Section 171A checklist (Development in regulated catchments)	REF finding
	the land and will not affect the overland flow path(s) of floodwaters.
BCSEPP – Section 6.9(1) - Recreation and public access In deciding whether to grant development consent to development on land in a regulated catchment, the consent authority must consider:	
(a) the likely impact of the development on recreational land uses in the regulated catchment	The proposal will be managed to ensure that access to recreational land is maintained where possible. However, during construction, access will be restricted to some recreational land (e.g. pits and compounds). Potential impacts will be managed with the mitigation measures in Table 5-14.
(b) whether the development will maintain or improve public access to and around foreshores without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation	Not applicable.
BCSEPP – Section 6.9(2) - Recreation and public access Development consent must not be granted to development on land in a regulated catchment unless the consent authority is satisfied of the following:	
(a) the development will maintain or improve public access to and from natural waterbodies for recreational purposes, including fishing, swimming and boating, without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation	Not applicable.
(b) new or existing points of public access between natural waterbodies and the site of the development will be stable and safe	Not applicable.
(c) if land forming part of the foreshore of a natural waterbody will be made available for public access as a result of the development but is not in public ownership—public access to and use of the land will be safeguarded	Not applicable.

Appendix B – Consideration of TISEPP consultation

TISEPP section	Yes	No
Section 2.10, council related infrastructure or services – consultation with council		
Will the work:		
Potentially have a substantial impact on stormwater management services provided by council?		X
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		X
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		X
Connect to, and use a substantial volume of water from a council owned water supply system?		X
Require temporary structures on, or enclose, a public space under council's control that will disrupt pedestrian or vehicular traffic that is not minor or inconsequential?	X	
Excavate a road, or a footpath adjacent to a road, for which the council is the roads authority, that is not minor or inconsequential?	X	
Section 2.11, local heritage – consultation with council		
Is the work likely to affect the heritage significance of a local heritage item, or of a heritage conservation area (not also a State heritage item) more than a minor or inconsequential amount?		X
Section 2.12, flood liable land – consultation with council		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and will works alter flood patterns other than to a minor extent?		X
Section 2.13, flood liable land – consultation with State Emergency Services		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and undertaken under a relevant provision*, but not the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance? * (e) Div.14 (Public admin buildings), (g) Div.16 (Research/ monitoring stations), (i) Div.20 (Stormwater systems)?		X
Section 2.14, development with impacts on certain land within the coastal zone– council consultation		
Is the work on land mapped as coastal vulnerability area and inconsistent with a certified coastal management program?		X
Section 2.15, consultation with public authorities other than councils		

TISEPP section	Yes	No
Will the proposal be on land adjacent to land reserved under the *National Parks and Wildlife Act 1974* or land acquired under Part 11 of that Act*? If so, consult with DPE (NPWS).*		X
Will the proposal be on land in Zone C1 National Parks and Nature Reserves or on a land use zone that is equivalent to that zone? *If so, consult with DPE (NPWS).*		X
Will the proposal include a fixed or floating structure in or over navigable waters? *If so, consult TfNSW.*		X
Will the proposal be on land in a mine subsidence district within the meaning of the *Coal Mine Subsidence Compensation Act 2017*? *If so, consult with Subsidence Advisory NSW.*		X
Will the proposal be on land in a Western City operational area specified in *the Western Parkland City Authority Act 2018,* Schedule 2 and have a capital investment value of $30 million or more? *If so, consult the Western Parkland City Authority*.		X
Will the proposal clear native vegetation on land that is not subject land (ie non-certified land)? *If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).*		X

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