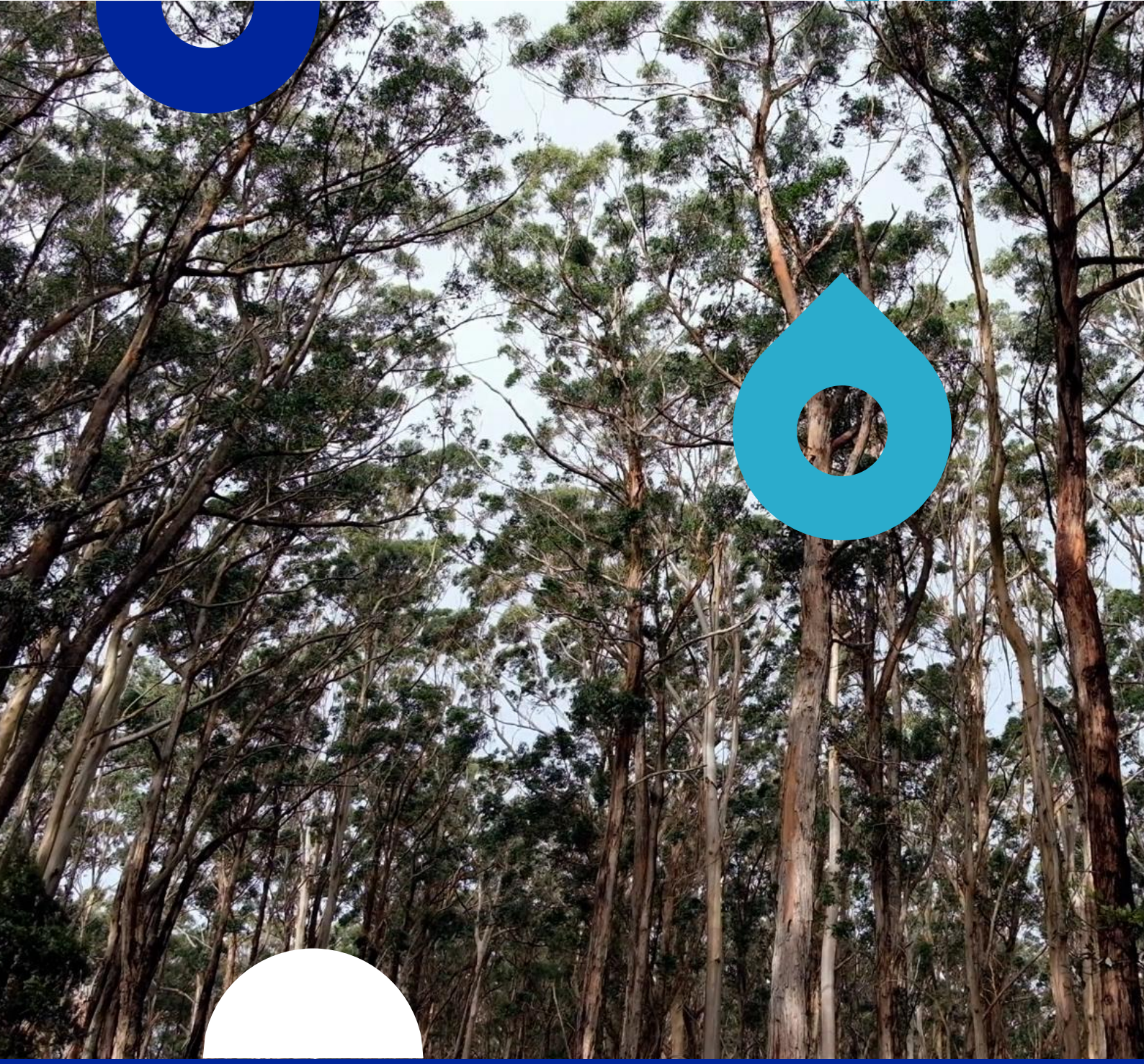


Review of Environmental Factors

Austral Leppington Wastewater Project Phase 2 (Kemps Creek Carrier Extension) (May, 2025)

Sydney WATER

sydneywater.com.au

SW 36 02/25

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Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of the Austral Leppington Wastewater Project Phase 2 (Kemps Creek Carrier Extension). 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. This REF is neither false nor misleading.

Prepared by:	Reviewed and endorsed by:	Endorsed by:
[redacted] Yameng Lai, Environmental Scientist, Sydney Water Date: 1 May 2025	[redacted] Jonathan Dowling, Senior Environment Scientist, Sydney Water Date: 1 May 2025	[redacted] Sarang Hanwante, Project Manager, Sydney Water Date: 1 May 2025

Decision Statement

The main potential construction environmental impacts of the proposal are vegetation clearing, erosion and sedimentation, noise and vibration emissions and increased traffic. During operation, the main impacts are associated with visual amenity of vent shafts. It is expected that these impacts would be minimal. The proposal would provide long term benefits by providing a wastewater network to a growing region.

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, ecological communities, or their habitats. Therefore, a Species Impact Statement and/or Biodiversity Development Assessment Report 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 [redacted] Senior Manager Environment and Heritage, Water and Environment Services, Sydney Water	Date: 1 May 2025

1. Executive summary

Sydney Water proposes to construct and operate the Austral and Leppington Wastewater Project in order to cater for predicted growth in demand for wastewater servicing in the South West Growth Area. Phase 1 of the Austral Leppington Wastewater Project was completed in 2023 and involved construction of the wastewater network in Austral. Phase 2 of the Austral Leppington Wastewater project would extend the wastewater network south to Leppington.

The main components of Phase 2 (the proposal) are:

- a new wastewater pumping station (SP1239) at Lot 2 DP1282649 Gurner Avenue, replacing the interim pumping station (SP1211)
- about 7 km of gravity pipeline to convey wastewater in Austral, Leppington and parts of Rossmore to SP1239
- maintenance holes at maximum spacings of 200 m along the alignment
- vent shafts at maximum spacings of 400 m along the alignment (about one every two maintenance holes).

Construction of SP1239 is expected to start in 2026 and be completed in 2028. The gravity pipes would be constructed by a combination of open trenching and trenchless methods. The construction of the pipelines may be delivered in two sections. The northern section (up to Bringelly Road) is expected to start in early 2026 and be completed in early 2027, and the southern section would start in early 2027 and be completed in early 2029.

The proposal is located in the suburbs of Austral and Leppington as well as parts of Rossmore within the local government areas of Camden Council and Liverpool City Council. The proposal alignment generally follows an existing 60 m wide Transgrid high voltage (HV) electrical easement and the Kemps Creek waterway.

As part of this REF, a number of options were considered and subsequent refinements to the design and construction methodology were made in order to minimise the environmental and community impact of the proposal to the extent practicable. This process included the selection of the alignment option on the eastern side of the Transgrid HV electrical easement which has reduced environmental impacts compared to the other options. This process also included the adoption of trenchless construction methods and reduction of the planned launch and receival shaft locations by maximising the drive lengths.

The main construction impacts are vegetation clearing, erosion and sedimentation, noise and vibration emissions and increased traffic movements. The proposal would involve clearing of up to 0.96 ha of native vegetation, including up to 0.22 ha of ‘existing native vegetation’ in non-certified land in the South West Growth Area (SWGA).

A Construction Environmental Management Plan, including subplans such as a Soil and Water Management Plan, Dewatering Management Plan, Dust Management Plan, and Traffic Management Plan would be prepared by the Delivery Contractor to mitigate potential environmental impacts.

The proposal will result in positive long-term benefits by servicing future growth and is aligned with the principles of ecologically sustainable development.

2. Introduction

2.1 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 Austral Leppington Wastewater Project Phase 2 (Kemps Creek Carrier Extension) and identifies mitigation measures that avoid or minimise potential impacts.

2.2 Proposal background and need

Sydney Water proposes to construct and operate the Austral Leppington Wastewater Project Phase 2 (the proposal) in order to cater for predicted growth in demand for wastewater servicing associated with the South West Growth Area (SWGA). The main components of the Kemps Creek Extension are:

- a new wastewater pumping station (SP1239), replacing the interim pumping station (SP1211)
- about 7 km of gravity pipeline to convey wastewater to SP1239
- maintenance holes
- vent shafts.

The gravity pipes would be constructed by a combination of open trenching and trenchless construction methods. During operation, the proposal would convey wastewater to SP1239. The wastewater would be pumped from SP1239 onto the new Upper South Creek Advanced Water Recycling Centre (AWRC) for treatment. The AWRC was approved as Critical State Significant Infrastructure and construction started in 2023.

The proposal, including its construction and operation, is described in further detail in Section 3.

2.2.1 Proposal need

The proposal is required to cater for the predicted growth in demand for wastewater servicing in parts of the SWGA. The SWGA is an area identified by the NSW Government to provide land for housing development with access to jobs, parks, schools and amenities.

The SWGA is divided into a number of precincts including Austral, Catherine Fields North, Kemps Creek, Leppington, Rossmore and several future industrial precincts. The proposal has been designed to cater for predicted growth in demand in parts of Austral, Leppington and Rossmore.

2.2.2 Proposal objectives

The proposal's objectives are to:

- meet the predicted future demand for wastewater services

- provide flexibility in the wastewater system to allow the network to be reconfigured when the Upper South Creek AWRC is operational.

2.2.3 Consideration of alternatives / options

Options assessment

Aurecon Arup, under the Planning Partnership, were engaged to carry out an options assessment and concept design. The options assessment informed the design of Phase 1 and Phase 2 of the project. It considered several factors including:

- environmental constraints identified through a preliminary environmental assessment (ENSure 2018)
- location of existing and future residential developments, including future connection points
- operational requirements.

Phase 1 of the project was constructed in 2023.

A number of options for Phase 2 (the proposal) were considered and refinements made over time. The opportunity to align the pipeline with an existing 60 m wide Transgrid high voltage (HV) electrical easement was identified. In general, the options that were considered were:

- Option 1 - a gravity main on the eastern side of the Kemps Creek waterway
- Option 2 - a gravity main on the western side of the Transgrid HV electrical easement
- Option 3 - a gravity main on the eastern side of the Transgrid HV electrical easement.

The location of SP1239 at Lot 2 DP1282649, Gurner Avenue is common to all options.

The options were assessed against the following criteria:

- Environmental impact, primarily impact to threatened vegetation communities
- Impact to private property
- Feasibility of option.

Table 2-1 provides an assessment of options against the criteria.

Table 2-1 Options assessment

Option	Environmental impact	Community impact	Feasibility
Option 1	This option would require removal of substantial threatened vegetation and potentially cause a significant impact. The construction footprint associated with launch and receival shafts also had potential to impact seven registered Aboriginal sites.	While this alignment would be mostly in the flood zone, it would potentially impact the future use of properties adjacent to the Kemps Creek waterway.	This option is feasible as the alignment follows the creek line (low point in the landscape) and wastewater from development can drain to the pipeline.

Option	Environmental impact	Community impact	Feasibility
Option 2	This option would have less vegetation clearing compared to Option 1. However, the construction footprint on the western side of the Transgrid HV electrical easement would extend into the riparian area resulting in substantial vegetation clearing. The construction footprint associated with launch and receival shafts had potential to impact Aboriginal sites near the Kemps Creek waterway.	By aligning the pipeline with the Transgrid HV electrical easement, this option would reduce the impact on private properties by making use of an existing infrastructure corridor.	Part of this alignment is located further from the creek line compared to Option 1. However, the pipe would be deep enough to allow all wastewater from the catchment to drain to the pipeline.
Option 3	This option would have less vegetation clearing compared to Option 1 and Option 2 as it makes the most use of an existing cleared infrastructure corridor. There would be no impact to Aboriginal sites.	By aligning the pipeline with the Transgrid HV electrical easement, this option would reduce the impact on private properties by making use of an existing infrastructure corridor.	Part of this alignment is located further from the creek line compared to Option 1 and Option 2. However, the pipe would be deep enough to allow all wastewater from the catchment to drain to the pipeline.

The preferred option was determined to be the gravity main on the eastern side of the Transgrid HV electrical easement (Option 3). This option would have reduced environmental impacts compared to the other options including impacts from flooding, and impacts to native vegetation and Aboriginal heritage.

Concept design

The preferred option was subsequently refined in concept design to further reduce environmental impacts (Aurecon Arup 2024). Due to the depth of the pipe, up to 17 metres deep, trenching would require a wide construction corridor and would likely result in a significant impact to threatened ecological communities. To reduce the construction impacts:

- the majority of the alignment would be constructed using trenchless construction methods
- part of the proposed alignment and some launch and receival shafts were relocated to minimise vegetation clearing
- the number of launch and receival sites were minimised and drive lengths were maximised to:
  - reduce the number of impacted residents
  - minimise vegetation clearing.

The construction footprint was defined by:

- considering of the number of launch and receival shafts required as they would form the locations of future maintenance holes
- identifying the size and orientation of launch and receival shafts
- identifying cleared areas to locate the launch and receival shafts
- identifying cleared areas around or near the launch and receival shafts for stockpiling and equipment and pipe storage
- identifying cleared areas and existing access tracks to launch and receival shafts to minimise vegetation impact.

Detailed design

During detailed design, further refinements to the design would consider:

- the location of access tracks to the launch and receival shafts (see consultation response from DPIRD Fisheries in section 4.3.1)
- the location of the emergency relief point and location of the access driveway to SP1239 (see consultation with Liverpool City Council in section 4.3.1).

2.3 Consideration of Ecologically Sustainable Development

Table 2-2 considers how the proposal aligns with the principles of ecologically sustainable development (ESD).

Table 2-2 Consideration of principles of ecologically sustainable development (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 practicable, and an assessment of the risk-weighted consequences of various options.*	The proposal would not result in serious or irreversible environmental damage. Subject matter experts have been engaged to provide assessments, the proposal alignment has been adjusted and mitigation measures have been designed to reduce scientific uncertainty relating to the proposal.
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 would help to meet the needs of future generations by providing a reliable wastewater service to an area of future growth.
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 would not significantly impact on biological diversity or impact ecological integrity. The proposal design was developed to minimise biodiversity impacts such as choosing the alignment option which had the least native vegetation clearing

Principle	Proposal alignment
	impact, and adjusting the location of launch and receival sites to minimise native vegetation clearing where possible.
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 would provide cost efficient use of resources and provide optimum outcomes for the community and environment.

3. Proposal description

3.1 Proposal details

The main components of the proposal are:

- a new wastewater pumping station (SP1239) at Lot 2 DP1282649 Gurner Avenue, replacing the interim pumping station (SP1211)
- about 7 km of gravity pipeline to convey wastewater in Austral, Leppington and parts of Rossmore to SP1239
- maintenance holes at maximum spacings of 200 m along the alignment
- vent shafts at maximum spacings of 400 m along the alignment (about one every two maintenance holes).

A proposal overview is provided in Figure 3-2 to Figure 3-4.

Pump station

SP1239 would be constructed on Lot 2 DP1282649, Gurner Avenue adjacent to the location of the existing SP1211. Excavation would be required for the construction of the wet wells and the inlet maintenance hole (MH). An emergency relief structure (ERS) from the pump station to the Kemps Creek waterway would also be constructed. The ERS was assessed and approved under the Phase 1 REF and Kemps Creek Pressure Main REF, and would be constructed as part of Phase 2 construction work.

SP1239 would have increased pumping capacity compared to SP1211. During operation, there would be 6 pumps (4 active and 2 on standby). SP1211 was constructed under Phase 1 as an interim pumping station and would be decommissioned once SP1239 is operational. SP1239 would initially connect to the existing wastewater network and replace the decommissioned SP1211, and it would pump wastewater flows to the Upper South Creek AWRC once that is operational. SP1239 would be accessed from Gurner Avenue during operation.

Trenchless construction

Pipes between Twelfth Avenue in Austral to Woolgen Park Road in Leppington would be constructed using micro-tunnelling. This would require launch and receival shafts. An illustration of micro-tunnelling is shown in Figure 3-1 below.

Sydney Water's Operational Standards requires maintenance holes be installed at least every 200 m along the pipeline. The locations of launch and receival shafts will form the locations of future maintenance holes. The shafts have been located to maximise the drive lengths and minimise the total number of launch and receival shafts required.

The launch and receival shafts would be about 8 m by 8 m wide and about 17 m deep at its lowest point.

Open trenching

Open trenching would occur at the northern end, Thirteenth Avenue, and southern end, Riley Road, of the proposal alignment. A short section of open trenching at Thirteenth Avenue would connect the proposal to "KC MH09" on the Phase 1 pipeline. About 200 m of open trenching would occur at Riley Road and

Woolgen Park Road on the southern end of the alignment. The proposal corridor is about 15 m wide and the trench width would likely be about 13 m. The Delivery Contractor may vary the trench width depending on the depth of the pipe and trench stabilisation methods.

Vent shafts

Maintenance holes would be equipped with vents at maximum spacings of 400 m along the alignment, which is approximately at every second maintenance hole. Vent shafts would be up to 18 m tall and up to 300 mm in diameter. As the majority of the proposal is within the existing Transgrid HV electrical easement, most of the vent shafts would therefore be located adjacent to the easement.

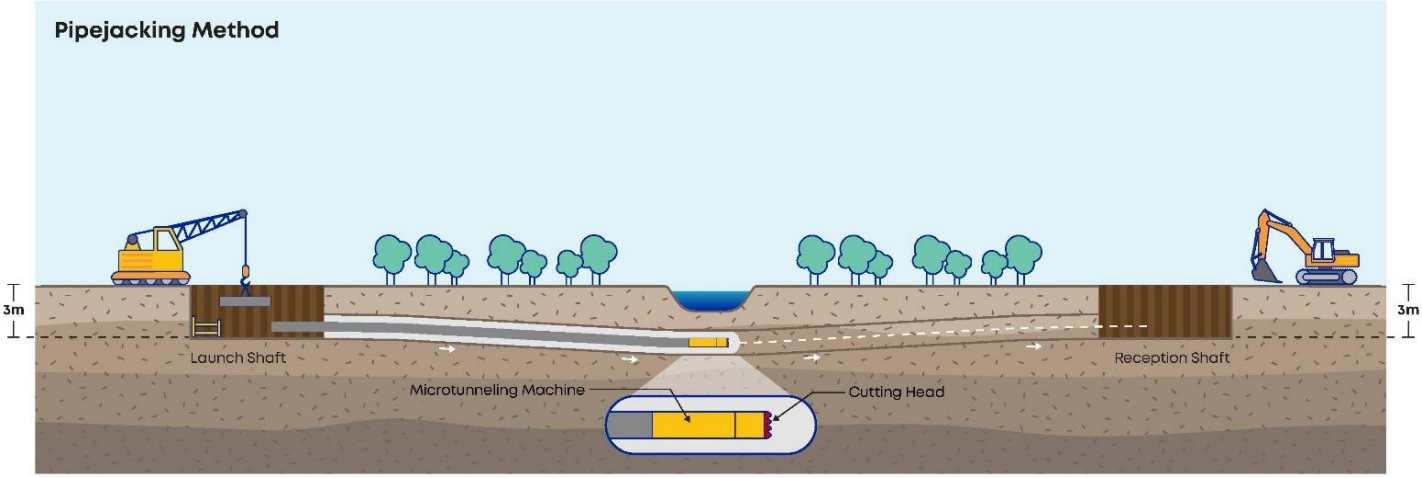


Figure 3-1 Illustration of micro-tunnelling construction

3.1.1 Location and land ownership

The proposal is located in the suburbs of Austral and Leppington as well as parts of Rossmore within the local government areas of Camden Council and Liverpool City Council.

The proposal intersects a large number of properties including Sydney Water owned land at the existing SP1121, road corridors, residential properties and environmental areas. The Lot and DP of these properties are listed in Appendix F – Intersected properties.

3.1.2 Site establishment and access tracks

Site establishment would include the installation of environmental controls, such as erosion and sedimentation controls, traffic controls, erection of signage and demarcation of any no-go areas. Site establishment may also include surveys, service location, geotechnical or other investigations required prior to construction.

The proposal would be accessed via the existing road network including Bringelly Road, Camden Valley Way and Cowpasture Road. Access between launch and receival shafts would generally be via existing local roads and temporary access tracks (Figure 3-2 to Figure 3-4). The final temporary access tracks would be developed in consultation with landowners.

3.1.3 Ancillary facilities

Construction compounds would be required for the establishment of site sheds, construction worker amenities, plant and equipment storage and materials laydown. These would likely be within the proposal area, adjacent to SP1239 or in other suitable nearby locations as chosen by the Delivery Contractor. This would be done in consultation with landowner(s) and approved by Sydney Water's Project Manager as described in the mitigation measures in Section 6.

There would likely be some drying lagoons established for any wet spoil extracted during trenchless construction. The locations of these drying lagoons are yet to be determined however they would be sited in such a manner as to avoid any material additional impacts to the environment. Sydney Water would be consulted prior to the establishment of any such drying lagoons. They would also be subject to the requirements concerning site restoration as described further below.

3.1.4 Methodology

The construction of the proposal would generally involve:

- set up environmental controls
- remove vegetation
- establish site compounds, access roads and hardstand areas
- divert existing site services and install temporary services
- construct the assets
- test and commission
- demobilise and restore site.

Excavated material would be temporarily stored within the proposal area and ultimately removed from the site if not suitable for reuse during restoration. The excavated material would generally be stockpiled adjacent to excavations and used as backfill. Topsoil would be stockpiled separately and then backfilled.

Pump Station

As described in section 3.1, SP1239 would include 6 pumps (4 active and 2 on standby) and an emergency relief structure. Construction of the new wastewater pumping station would involve:

- excavate and install subsurface infrastructure, including wet wells
- stabilise and protect excavation from groundwater ingress
- carry out concrete work and install equipment including, pumps and chambers
- carry out building work including construction of pumping station housing
- install emergency relief pipes
- carry out ancillary work including access, drainage, utilities, lighting and fencing
- connect wastewater pumping station to wastewater pipeline.

Once SP1239 is constructed, the interim pump station (SP1211) would be decommissioned.

Open trenching

As described in section 3.1, there would be a short section of open trenching at Thirteenth Avenue to connect the proposal to “KC MH09” on the Phase 1 pipeline and about 200 m of open trenching at the southern end of the alignment. The depth of the pipe at Thirteenth Avenue is about 12 m and the depth at the southern end of the alignment is about 6 m. Construction by open trenching methods would involve:

- string pipe sections along the construction corridor
- excavate trenches
- bench and shore up trenches
- spread granular bedding material such as sand or gravel in trenches
- install pipeline within trenches
- connect to existing wastewater network.

Trenchless construction

As described in section 3.1, the majority of the alignment would be constructed using micro-tunnelling. These sections would be a maximum of 17 m below ground.

Construction by micro-tunnelling would involve:

- excavate launch and receival shafts to depth of the pipe
- shore up shafts
- install micro-tunnelling machine
- carry out micro-tunnelling and install pipe sections
- connect to existing wastewater network.

Vent shafts and maintenance holes

As described in section 3.1, there would be maintenance holes at maximum spacings of 200 m and vent shafts at maximum spacings of 400 m along the alignment. There would be approximately one vent shaft at every second maintenance hole. Vent shafts located adjacent to the Transgrid HV electrical easement would be made from non-metallic materials. Vent shafts would be up to 18 m tall and up to 300 mm in diameter and would be built on a concrete base of about 2.5 m by 2.5 m. Some maintenance holes and vent shaft bases would be raised by 150 mm to be above flood levels. Construction of vent shafts would generally occur simultaneously with the construction of maintenance holes.

Commissioning

Commissioning involves testing and running the new equipment to ensure it works correctly and is integrated with existing operations. The exact commissioning steps depend on the type of the equipment, but typically include:

- pressure and vacuum testing pipelines
- testing utilities, telemetry and switchboards
- inspection and performance testing of equipment, joints and fittings

- testing of any emergency systems.

Restoration

Disturbed areas would be restored to a condition similar to their pre-existing condition in consultation with landowners. This may include:

- backfilling
- dismantling, cleaning and restoring site compound areas
- removing environmental controls
- reinstating topsoil and groundcover
- reusing cleared vegetation as mulch
- reinstating removed habitat such as hollow logs and tree hollows
- revegetating to offset cleared vegetation.

Revegetation would be carried out in accordance with Sydney Water's *SWEMS0025.11 Guideline for native revegetation* following construction. Refer to section 6.2.3 for further details on native vegetation clearing and offsets.

Access tracks may be retained onsite for use by Sydney Water operational maintenance crews, in agreement with landowners.

Materials and equipment

The materials required for the construction of the project would include general construction materials such as concrete, prefabricated sections of the pipes, associated conduit and bedding materials, various components of the wastewater pumping station such as pumps, and other materials as required.

The construction of the project would involve the use of a range of vehicles, equipment and machinery, which would indicatively include:

- compactors
- cranes
- dump trucks
- excavators
- skip bins
- storage containers
- front end loaders
- generators
- micro-tunnelling machines
- portable pumps
- rock breakers
- rollers
- light, medium and heavy vehicles
- site facilities and amenities
- various handheld power tools
- water carts.

The construction of the project would involve excavation, and while excavated material would generally be used as backfill, it is likely that there would be excess material, including wet material from the trenchless construction. The management of this and other waste material generated by construction is discussed in section 6.2.8.

It is expected that the project would require a construction workforce in the order of 400 people at a given time across all construction areas.

Work hours

Where possible, work and deliveries would be scheduled to occur during standard daytime hours of:

- 7am to 6pm, Monday to Friday
- 8am to 1pm, Saturdays.

Some work, such as trenchless drilling, may occur during an extended Saturday shift (8am to 5pm).

Work and deliveries that may be scheduled out of hours include:

- deliveries of materials and movements of oversized vehicles, to meet Transport for NSW guidelines and to minimise traffic and access impacts for local residents
- emergency works to prevent loss of lives, impact to property or prevent environmental harm.

This would be approved by the Sydney Water Project Manager in line with the mitigation measures described in Section 6.

Proposal timing

Construction of SP1239 is expected to start in 2026 and be completed in 2028. The gravity pipes would be constructed by a combination of open trenching and trenchless methods. The construction of the pipelines may be delivered in two sections. The northern section (up to Bringelly Road) is expected to start in early 2026 and be completed in early 2027, and the southern section would start in early 2027 and be completed in early 2029.

Operational requirements

During operation, the proposal would convey wastewater to SP1239. From there wastewater would be pumped to the Upper South Creek AWRC for treatment. Once operational, the proposal would be subject to standard and routine maintenance activities such as inspections, testing and repairs as necessary.



Figure 3-2 Overview of the proposal



Figure 3-3 Overview of the proposal - north



Figure 3-4 Overview of the proposal - south

3.2 Field assessment area 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. The final proposal may change based on detailed design or construction planning. The mitigation measures outline when changes to the proposal trigger supplementary environmental impact assessment. If the proposal, construction methods or construction timing described in this REF change significantly, further assessment must be prepared for the amended components in accordance with SWEMS0019.

Changes to the proposal outside the assessment area may only occur:

- to reduce impacts to biodiversity, heritage or human amenity, or
- to avoid engineering (for example geological, topographical) constraints, and
- after consultation with any potentially affected landowners and relevant agencies.

An addendum REF is not required provided the changes:

- remain within the assessment area of this REF and has no net additional environmental impact, or
- is outside the assessment area of the REF but reduces the overall environmental impact of the project (s.5.4(a) of the EP&A Act).

The Delivery Contractor would demonstrate in writing how the changes meet these requirements and Sydney Water's Project Manager would review the request, in consultation with the environmental and community engagement representatives.

4. Consultation

4.1 Community and stakeholder consultation – general

Our approach to community and stakeholder consultation is guided by the Policy and Guidelines for Community and Stakeholder Engagement (Sydney Water, 2019). 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, 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 would consult with directly impacted landowners and the wider community through a variety of ways and through different stages of the project. This includes engaging the community and stakeholders during plan or strategy development or before making key decisions. We would also have one-on-one discussions with impacted landowners about the design of the proposal and its potential construction impacts.

Sydney Water's community engagement team or the Sydney Water Project Manager will provide Camden Council and Liverpool City Council with reasonable notice to discuss potential impacts and commencement of work, regardless of the need for development consent. The councils would be consulted about matters identified in environmental planning instruments (refer to section 4.2 below). This includes public safety issues, any temporary work on council land, and full or partial road closures of council managed roads.

4.2 Community and stakeholder consultation – proposal

During options assessment and concept design phases, Sydney Water engaged with a range of stakeholders regarding the proposal, including:

- Liverpool City Council
- Transport for NSW
- Transgrid.

Additionally, Sydney Water engaged with the community by:

- working with 39 landowners to facilitate access for site investigations
- providing a community-wide project update via letter box drop to properties along the proposed alignment
- facilitating ongoing phone calls and emails between Sydney Water and landowners.

A Community and Stakeholder Engagement Plan (CSEP) has been developed for the proposal which outlines the approved method for consultation with nearby residents and stakeholders. The community and stakeholders would be informed about:

- the proposed start date
- where we would be working and when
- what to expect during each stage of the proposal's progress.

Before and during construction, Sydney Water would ensure the Delivery Contractor is mindful of the community, that they inform the community about any work that may impact nearby residents, and that they leave a positive legacy when the work is done.

Engaging with the community enables Sydney Water and its contractors to listen and understand community values. Feedback would be used to improve our performance and all complaints during the construction of the proposal. Following its commissioning, feedback would be managed according to Sydney Water's Customer Complaint Policy and Procedure.

The issues raised with stakeholders and how they are addressed in the REF are summarised in Table 4-1 below.

Table 4-1 Consultation discussion and outcomes

Stakeholder	Summary	Addressed in the REF
Camden and Liverpool City Councils - The proposal area is within the administrative boundaries of Camden Council and Liverpool City Council.	• Sharing of project information. • Discussion of construction impacts to reserves, roads and stormwater services. • Discussion of design of SP1239, and opportunities to align the emergency relief point with Liverpool City Council's proposed stormwater channel. • Discussion of easements and access to SP1239 to be moved to the western side of the lot, allowing Liverpool City Council to continue planning for public recreational facilities. • Sydney Water committed to ongoing consultation with Liverpool City Council to align utility opportunities and minimise impacts to recreation facilities.	Additional mitigation measures have been incorporated into the REF where relevant.
Transport for NSW - The proposal alignment involves underboring the part of the railway between	• Sharing of the concept design (focusing on the railway crossing). • Discussion of work during or outside of track possession times.	Mitigation measures have been incorporated into the REF where relevant.

Stakeholder	Summary	Addressed in the REF
Leppington station and Leppington Stabling Yard.	• Initiation of the application for building near railways.	
Transgrid - The proposal generally follows the east side of the Transgrid HV electrical easement for about 5 km.	• During options assessment, Transgrid were consulted on the opportunity to align the proposal with their existing easement. • Transgrid's technical team, access and maintenance team, property portfolio team, and asset management team reviewed the proposal alignment and provided the conditions of approval. • Transgrid's conditional approval was received in December 2024 (reference no. 2024-310) and the proposal was chosen as the preferred option. • The proposed alignment reduces environmental impacts, notably vegetation clearing requirements, impacts to known heritage sites and avoids known contamination areas.	Conditions of approval and additional mitigation measures have been incorporated into the REF where relevant.

4.3 Consultation required under State Environmental Planning Policies and other legislation

4.3.1 Consultation under TISEPP

Appendix B – Consideration of TISEPP consultation provides a summary of the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP) consultation requirements. Under the TISEPP, 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.

Liverpool City Council

Section 2.12 of the TISEPP specifies that consultation with council is required for work on flood liable land that will alter flood patterns to more than a minor extent. As summarised above in Table 4-1, Sydney Water is committed to ongoing consultation with Liverpool City Council on potential changes to flood patterns around SP1239 and to minimise potential impacts to recreation facilities.

NSW National Parks and Wildlife Services

Section 2.15(2)(a) of the TISEPP specifies that consultation with NSW National Parks and Wildlife Services (NPWS) is required for development adjacent to National Parks and Wildlife land. SP1239 would be on land

adjacent to the Kemps Creek Nature Reserve which is managed by NPWS. NPWS were notified on 21 March 2025 and confirmed receipt on 26 March 2025. A formal response has not been received to date. Sydney Water would continue to consult with NPWS during detailed design and construction.

Western Parkland City Authority

Section 2.15(2)(h) of the TISEPP specifies that consultation with the Western Parkland City Authority (WPCA) is required for a development within a Western Parkland City operational area as shown in Schedule 2 of the *Western Parkland City Authority Act 2018* that has a capital investment value of $30 million or more. Consultation is required as the proposal has a capital value of greater than $30 million, and is within a Western Parkland City operational area. WPCA, now the Bradfield Development Authority (BDA), were notified on 12 March 2025 and a response was received on 24 March 2025. Table 4-2 outlines the comments received and Sydney Water's response.

Table 4-2 Comments from BDA and Sydney Water's response

Comment	Sydney Water Response
The Bradfield Development Authority has reviewed the submitted documents and while supporting Sydney Water delivering infrastructure for Western Sydney, has no further comments on the project.	Sydney Water notes BDA's support for the proposal.

Department of Planning, Housing and Infrastructure

The proposal would involve clearing of up to 0.96 ha of native vegetation, including up to 0.22 ha of 'existing native vegetation' in non-certified land in the South West Growth Area (SWGA). As such the Department of Planning, Housing and Infrastructure (DPHI) was notified under SEPP (Precincts – Western Parkland City) 2021 on 19 March 2025, and their response was received on 9 April 2025. Additionally, DPHI consulted the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) however comments have not been received to date. Sydney Water would continue to consult DCCEEW during detailed design and construction. Table 4-3 outlines the comments received from DPHI and Sydney Water's response.

Table 4-3 Comments from DPHI and Sydney Water's response

Comment	Sydney Water Response
DPHI requests that the REF and Biodiversity Assessment be provided	Sydney Water will provide the REF and Biodiversity Assessment Report (BAR) once the REF is determined.
The REF must include details of the intended approach to and location of offsets	Sydney Water has sufficient credits to offset the proposed impact to ENV. The offset credits are from Western Sydney Parklands in the growth centres. The credits would be retired once the exact ENV clearing is verified.
The Department requests Sydney Water to demonstrate compliance with the Growth Centres Biodiversity Certification Order. This	ENV cleared by the proposal would offset at a ratio of 3:1 in accordance with the BCO.

Comment	Sydney Water Response
includes that all clearing of ENV in the non-certified areas must be offset through the protection of an equal or greater area of ENV and/or revegetation and/or restoration at a 3:1 ratio within the Growth Centres as required by relevant biodiversity measure 11.	

Department of Primary Industries and Regional Development

The proposal would potentially involve some excavation and vegetation clearing within 'Key Fish Habitat' areas, which constitutes 'dredging' under the *Fisheries Management Act 1994*. As such, the Department of Primary Industries and Regional Development (DPIRD) was notified under s199 of the *Fisheries Management Act 1994* on 14 March 2025 and their response was received on 24 March 2025. Additional mitigation measures and recommendations from DPIRD have been incorporated in this REF. Table 4-4 outlines the comments received and Sydney Water's response.

Table 4-4 Comments from DPIRD and Sydney Water's response

Comment	Sydney Water Response
Excluding waterway crossings across key fish habitat for access to proposal sites, DPIRD Fisheries has no objections to the proposed works as described in the notification letter, provided the following recommended mitigation measures are implemented.	Sydney Water notes DPIRD's support for the proposal. The below mitigation measures have been considered an adopted.
DPIRD recommended mitigation measures:	
1. Any pipelines laid across the waterway and associated casing must be placed below the bed of the waterway. There must not be any blockage of fish passage from these pipelines.	Sydney Water notes that pipes would be below the bed of the waterway and fish passage would not be blocked.
2. Erosion and sediment mitigation devices are to be erected in a manner consistent with current Best Management Practice (i.e. Managing Urban Stormwater: Soils and Construction 4th Edition Landcom, 2004) to prevent entry of sediment into the waterway prior to any earthworks being undertaken. These are to be maintained in good working order for the duration of the works and subsequently until the site has been stabilised and the risk of erosion and sediment movement from the site is minimal.	Mitigation measure adopted (refer to section 6.2.1).
3. There is to be no complete blockage of fish passage during the works. Environmental protection measures of (if required) coffer dams are to be erected in a semi-circular arrangement around each bank so that fish passage is maintained in the waterway. These measures are to be removed from the site once the site has been stabilised and the risk of sediment movement is minimal.	Sydney Water notes that coffer dams are not proposed for this proposal. General fish passage mitigation measures adopted (refer to section 6.2.3).

Comment	Sydney Water Response
4. Any material removed from the waterway that is to be temporarily deposited or stockpiled on land is to be located well away from the waterway and to be contained by appropriate erosion and sediment control devices.	Mitigation measure adopted (refer to section 6.2.1).
5. On completion of the works, all disturbed soil is to be levelled, smoothed and sown with a mixture of sterile/native grass seeds to encourage rapid vegetation and planted out with native endemic riparian vegetation.	Mitigation measure adopted (refer to section 6.2.3).
6. Machinery is not to enter or work from the waterway unless in accordance with the proposed works.	Mitigation measure adopted (refer to section 6.2.2).
7. Prior to use at the site and/or entry into the waterway machinery is to be appropriately cleaned, degreased and serviced. Spill kits are to be available on site at all times during the works.	Mitigation measure adopted (refer to section 6.2.2).
8. Works are to be undertaken during low flows in the waterway.	Mitigation measure adopted (refer to section 6.2.2).
9. Should any dewatering be required, then: a. pumps used in waterways are to be screened with mesh of no greater than 6 mm diameter, b. daily checks of the sediment levels in the dewatering sediment dams are to be conducted to ensure adequate storage capacity, c. dewatering operations must ensure retention of spoil for a long enough period to allow mobilised sediments to settle out, d. a visual inspection of the waterway is to be conducted at all times during dewatering operations to ensure that no visible plumes are generated within the waterway from dewatering operations.	Sydney Water notes that pumps within waterways are not required. All other mitigation measures adopted (refer to section 6.2.2).
10. DPIRD Fisheries (1800 043 536) and the Environmental Protection Authority (EPA) (131 555) are to be notified immediately if any fish kills occur in the vicinity of the works. In this situation, all works other than emergency response procedures are to cease until the issue is rectified and approval is given by DPIRD Fisheries and/or the EPA for the works to proceed.	Mitigation measure adopted (refer to section 6.2.2).

5. Legislative requirements

5.1 Strategic context

Table 5-1 below provides a summary of the strategic plans relating to the proposal.

Table 5-1 Summary of relevant strategic plans

Strategic Plan	Relevance to the proposal
Greater Sydney Region Plan – A Metropolis of Three Cities (March 2018)	This plan sets a 40-year vision (to 2056) and establishes a 20-year plan to manage population growth and change for Greater Sydney in the context of social, economic and environmental matters. It aims to create new jobs, provide more housing choices, improve transport connectivity, and enhance the natural and built environment. The proposal directly supports the plan's key strategies through Sydney Water's delivery of critical wastewater infrastructure in future growth areas and by improving and expanding wastewater servicing. This enhances liveability for current and future populations. The proposal also enables development and greater productivity opportunities and improves sustainability by connecting wastewater infrastructure to an integrated water cycle.
Western Sydney Regional Master Plan (March 2020)	Greater Sydney's population is forecast to reach 8 million people over the next 40 years, and about half of those people are expected to be living west of Parramatta. Much of this growth would occur in the Western Parkland City, driven by the new Western Sydney International Airport. This plan guides Sydney Water's planning and delivery of essential water services in the Western Sydney growth areas. Over the coming years, the region is set to become the economic powerhouse of Greater Sydney. This area would need commercial and industrial developments to host the businesses, residential areas to house the workforce and infrastructure to service their access and utility needs. Most of the Western Parkland City, the Western Sydney Aerotropolis Growth Area (WSAGA) and SWGA are not serviced by Sydney Water and use on-site systems such as septic tanks. This proposal would build on the existing network to further establish access to wastewater services in the SWGA.
Greater Sydney Water Strategy: Water for a thriving, sustainable and resilient Sydney (August 2022)	This strategy recognises that wastewater management plays a crucial role in achieving a variety of outcomes for the SWGA. This strategy outlines the priorities and actions for delivering essential water services to support a sustainable, liveable and productive Greater Sydney. Sydney Water's AWRC would contribute to improving wastewater management and resource recovery from wastewater in Greater Sydney. The proposal would enable the wastewater collected in the surrounding area to be directed to the AWRC where treatment and resource recovery can take place through an integrated water cycle process. As Greater Sydney continues to become denser and extend into new areas, the reuse and recycling of wastewater would be essential to support a more productive and sustainable region.
Camden and Liverpool Local Strategic	The LSPSs outline a vision for the future land use for the LGAs, focusing on sustainability, liveability and growth. The statements identify key goals, such as promoting sustainable development, enhancing community infrastructure,

Strategic Plan	Relevance to the proposal
Planning Statement (LSPS)	supporting economic development, and preserving the natural environment. They aim to provide a framework for future development and guide decision-making to ensure continued growth and prosperity while preserving the area's unique character and natural assets. The proposal would support the LSPSs, by providing a means for wastewater from the surrounding area to be transferred to the AWRC. The wastewater would then be treated to a high level of quality that would be suitable for reuse in a range of applications. Additionally, given the majority of the proposal would be located below ground, it is unlikely to significantly affect the councils' ability to implement any future land use plans.

5.2 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 5-2) and legislation (Table 5-3) are relevant to the proposal. Table 5-3 also documents any licences and permits required, and timing and responsibility for obtaining them.

Table 5-2 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Liverpool Local Environmental Plan (LEP) 2008 Camden LEP 2010	The proposal is located on land zoned: • C2 Environmental conservation • C4 Environmental living • IN2 Light Industrial • R2 Low density residential • RE1 Public recreation • RU4 Primary production small lots • RU6 Transition • SP2 Infrastructure.
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Section 2.126 of the TISEPP permits development by or on behalf of a public authority for sewage reticulation systems without consent on any land. The proposal involves development of a sewage reticulation system and as Sydney Water is a public authority, the proposal is permissible without consent.

Environmental Planning Instrument	Relevance to proposal
State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Growth Centres SEPP)	The Growth Centres SEPP coordinates the release of land for development. The project is located within the South West Growth Centre on both 'certified' and 'non-certified' land in the biodiversity certification order. Parts of the proposal are location on 'non-certified' land. The benefits of biodiversity certifications do not apply to non-certified land. 'Existing Native Vegetation' (ENV) in non-certified areas would be offset at a ratio of 3:1 in accordance with the biodiversity certification order. A small amount of mapped Existing Native Vegetation (ENV) within 'non-certified land' is within the construction corridors. **Growth Centres Development Code 2006** The relevant biodiversity objectives of the development code are to: • ensure protection of biodiversity values within areas identified by the Growth Centres SEPP • retain and enhance as much existing vegetation as practicable within the development precincts. A biodiversity assessment to assess the potential impact to native vegetation, threatened species, populations or ecological communities on non-certified land is required and has been conducted as part of this REF (see Appendix C – Biodiversity). The BAR, section 2.2.3, section 6.2.3 and the mitigation measures in this REF align with the relevant biodiversity objectives within the development code.
State Environmental Planning Policy (Precincts – Western Sydney Parkland) 2021 (Western Sydney Parklands SEPP)	**Sydney region growth centres (Chapter 3)** The Western Parkland City SEPP coordinates the release of land for residential, employment and other urban development, in the Western Parkland City area. Chapter 3 applies to growth centres, including the SWGA. The proposal is located within the SWGA and is subject to the conditions of the Biodiversity Certification Order (BCO) of the former *State Environmental Planning Policy (Sydney Region Growth Centres) 2006*. The BCO establishes certified areas in which proponents of developments do not need to undertake assessment of impacts on threatened ecological communities, species and populations, or their habitats that would normally be required by the *Environmental Planning and Assessment Act 1979*. The BCO also identifies non-certified areas where impacts to existing native vegetation (ENV) (as defined in the BCO) must be assessed and offset in accordance with the BCO. The proposal would impact 0.22 ha of ENV. This impact must be offset at a ratio of 3:1 in accordance with the BCO. Section 3.24 of the Western Parkland City SEPP relates to public utility undertakings (such as construction and operation of a wastewater pipeline) and clearing of native vegetation within the subject area of a BCO. Section 3.24(2) establishes that a public authority must not clear native vegetation within the subject area of a BCO unless notice has been made to DPHI. Consideration of any response received within 21 days of the notice is then required.

Environmental Planning Instrument	Relevance to proposal
	Consultation carried out for the proposal is described in Section 4.
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BCSEPP)	**Vegetation in non-rural areas (Chapter 2)** Chapter 2 of this SEPP aims to protect the biodiversity and amenity value of trees and other vegetation in non-rural areas of the State. 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. 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 lies within the City of Liverpool LGA, which is in the Central Coast Koala management area. Chapter 3 does not apply to the City of Liverpool LGA. While Chapter 4 applies to the whole LGA, it does not apply to land which a biodiversity certification has been conferred. Development that is being carried out under TISEPP is not subject to the planning provisions of the chapters 3 and 4 of the BCSEPP, however the aims and management actions have been considered as applicable (see Section 6). **Water catchments (Chapter 6)** Chapter 6 of this SEPP applies as the proposal is within the Hawkesbury-Nepean Catchment, a regulated catchment area. Section 6 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. **Strategic conservation planning (Chapter 13)** The works are within the Cumberland Plain Conservation Plan (CPCP) application area. However, the proposal is not located on land mapped under the CPCP. Sydney Water has therefore not considered the requirements of this Chapter.

Table 5-3 Consideration of environmental legislation relevant to the proposal

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Protection of the Environment Operations Act 1997 (POEO Act)	The POEO 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. Sewage treatment is a scheduled activity under the POEO Act. The proposal would initially connect to the existing network that operates under the Malabar EPL 372. The network would be reconfigured and the proposal would ultimately operate under the future Upper South Creek AWRC EPL. Construction and operation of the proposal is not a scheduled activity. As such a new EPL is not required. The Delivery Contractor is responsible for immediately reporting such incidents in accordance with *SWEMS0009.*	REF	Pre-construction, Sydney Water
Biodiversity Conservation Act 2016 (BC Act)	The BC Act lists threatened species, populations and ecological communities to be considered in deciding whether there is likely to be a significant impact on threatened biota, or their habitats. If any of these could be impacted by the proposal, an assessment of significance 'Test of Significance' (ToS) that addresses the requirements of section 7.3 of the BC Act must be completed to determine the significance of the impact. The certification of land is governed by Part 8 of this Act. Section 8.4(5) states that a determining authority under Part 5 of the EP&A Act is not required to consider the effect on biodiversity of an activity, to the extent that it is carried out on biodiversity certified land. The proposal is partly located within land certified under the South West G rowth Area. The impact of the proposal on threatened species, communities and their habitats in non-certified land is described in Section 6.2.3 and Appendix C – Biodiversity Assessment Report. Significant impacts to	REF	Pre-construction, Sydney Water

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	threatened species, communities or their habitats are unlikely.		
National Parks and Wildlife Act 1974 (NPW Act)	This Act provides for the establishment, preservation, and management of areas such as national parks, state conservation areas, nature reserves, and Aboriginal areas. This Act also provides for the protection of Aboriginal heritage, including Aboriginal objects and places. The proposal in not within national parks, state conservation areas or nature reserves. SP1239 is located adjacent to land managed under the NPW Act and consultation with NSW NPWS has commenced (refer to section 4.3.1). An Aboriginal Heritage Impact Permit is not required for the works at this stage as they would not disturb known areas of Aboriginal Heritage.	REF	Pre-construction, Sydney Water
Fisheries Management Act 1994 (FM Act)	The FM Act protects threatened species, populations and communities of fish and marine vegetation, commercial and recreational fishing areas, in NSW waters. A permit and/or notification is required under Part 7 of the FM Act for activities that involve dredging and reclamation work, temporarily or permanently obstructing fish passages and for harming marine vegetation. The proposal would require trenchless construction below Kemps Creek which is mapped as Key Fish Habitat. Under section 199 of the FM Act, a public authority can carry out dredging or reclamation work without a permit provided that: • the Minister is given written notice of the proposed work • consider any matters concerning the proposed work that are raised by the Minister within 21 days after the giving of the notice (or such other period as is agreed between the Minister and the public authority).	Notification Permit (if fish passage is to be blocked)	Pre-construction, Sydney Water Delivery Contractor

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	Consultation carried out for the proposal is described in section 4.		
Water Act 1912/ Water Management Act 2000	Section 60A of the *Water Management Act 2000* states that it is an offense to take water without a licence. A water supply work approval (WSWA) is required under Section 90(2) of the Act to dewater up to 3ML of groundwater. A Water Access Licence (WAL) is required under Section 61 of the Act where groundwater extraction would be greater than 3 ML. At the time of writing, the anticipated groundwater dewatering volume is unknown. During detailed design, groundwater dewatering volumes would be calculated. If it is identified that more than 3 ML of groundwater would be extracted, a WSWA and a WAL would be required.	WSWA (for <3ML) and WAL (for >3ML)	If known during planning, post REF, Sydney Water If unknown, pre-construction, Delivery Contractor.
Roads Act 1993	This Act regulates works in, on, or over a public road. Approval under Section 138 of this Act is required for carrying out works in, digging up, or disturbing a public road. A Road Occupancy Licence (ROL) would be required from the relevant roads authority prior to work on public roads and any temporary road closures during construction of the proposal. Potential impacts of the proposal on traffic and access, including road works, are described in Section 6.2.9.	Road Occupancy Licence	Pre-construction, Delivery Contractor
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 (MNES). Under the EPBC Act, an action that is likely to have a significant impact on a MNES must be referred to the Commonwealth Minister for the Environment and Water. The proposal is not likely to have a significant impact on a MNES and has accordingly not been referred.	N/A	N/A

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	A strategic assessment under Part 10 of the EPBC Act for the Sydney Growth Centres was carried out. The assessment details a program that commits to deliver a range of biodiversity outcomes for MNES, including securing conservation areas within the Growth Centres and high quality remnant vegetation outside the Growth Centres. This offsets urban development and aligns with the Growth Centres Biodiversity Certification.		
Crown Land Management Act 2016	The proposal alignment is not mapped within a Crown land or watercourse.	N/A	N/A

6. Environmental assessment

Section 6.2 describes the existing environment and assesses direct and indirect impacts of construction and operation of the proposal. It also identifies mitigation measures to minimise impacts. These would be incorporated into contract documents and a Construction Environmental Management Plan (or similar) prior to starting work.

6.1 Existing environment

The proposal is in the suburbs of Austral, Leppington and Rossmore, in the Liverpool City Council LGA and Camden Council LGA. It generally follows the Kemps Creek waterway and an existing Transgrid HV electrical easement, surrounded by vegetation, rural and agricultural land uses, and low density development. Extensive, historical clearing of native vegetation and intensive grazing by cattle is evident across the landscape. Environmentally sensitive areas include the Kemps Creek waterway and its associated riparian areas, threatened ecological communities (TECs) and existing native vegetation (ENV) areas. Much of the remnant native vegetation tends to be located along creek lines.

Aboriginal heritage sites are found throughout south western Sydney, particularly around waterways. The area contains a number of Aboriginal heritage sites, and undisturbed areas in the vicinity of the creek are a high risk landscape with the potential for additional Aboriginal heritage sites to be present. A number of non-Aboriginal heritage sites are also listed in the general area. However, no sites would be directly affected by the proposal.

The existing environment is further described in Section 6.2 below.

6.2 Environmental aspects, impacts and mitigation measures

6.2.1 Topography, geology and soils

Existing environment

The existing environment is summarised below:

- The topography of the broader area is relatively flat, with gentle undulations and elevations.
- The geology is characterised by Wianamatta Group rocks comprising of shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff. Areas close to the Kemps Creek waterway are made up of fine-grained sand, silt and clay.
- The proposal area is characterised by Residual Blacktown (REbt) and Alluvial South Creek (ALsc) soils.
- The broader area has localised salinity potential and areas close to waterways have high salinity potential.
- The proposal area does not contain acid sulfate soils.

- The proposal is not in an area impacted by an existing exploration or mining title (NSW Exploration and Mining Titles dataset, Department of Regional NSW).

Current and historic land uses include residential, agriculture and local businesses. Construction during Phase 1 of the project encountered asbestos containing material (ACM). Additionally, evidence of uncontrolled dumping and filling was observed during field visits and suggests the potential for contamination in the proposal area.

Figure 6-1 provides an overview of the geology and soils within the proposal area.

EPA contaminated land record of notices

A search of the EPA contaminated land record of notices database (March 2025) identified no sites within the Camden Council LGA and 3 sites within Liverpool City Council LGA. These are summarised below:

- Former ACR, Chipping Norton, 15 km east of Gurner Avenue
    - The site was issued a declaration of remediation site in 2003 as soil and groundwater was contaminated by a range of contaminants including petroleum hydrocarbons, volatile chlorinated hydrocarbons and heavy metals.
- Denham Court Caravan Park and Service Station, Denham Court, 5 km east of Riley Road
    - The site was issued an EPA declaration of significantly contaminated land in 2020 as soil and groundwater was contaminated by a range of petroleum hydrocarbons. Contaminated groundwater has migrated offsite to adjoining properties.
- ABB Australia Pty Ltd, Moorebank, 11 km east of Boyd Street.
    - The soil at the site is contaminated by polychlorinated biphenyls. A layer of capping material has been placed over the in-site contaminated soil.

POEO public register

A search of the POEO public register (March 2025) identified a number of sites within the suburb of Austral, Leppington and Rossmore that have clean up notices, penalty notices and POEO licences. This includes several sites near the proposal area on Tenth Avenue, Twelfth Avenue, Gurner Avenue, Boyd Street and Eastwood Road.

NSW Government PFAS investigation program

The environmental and potential human health impacts from exposure to per-and poly-fluoroalkyl substances (PFAS) are of increasing concern worldwide. PFAS contamination is significant due to its persistence and potential for bioaccumulation. To address this, the PFAS National Environmental Management Plan (NEMP) was established to regulate PFAS in the environment. Currently, the NSW EPA is conducting a state-wide investigation program to assess the use and impacts of legacy PFAS.

A search of the PFAS Investigation Program (March 2025) identified 1 site within 10 km radius of the proposal:

- Rural Fire Service (RFS) Kemps Creek Training Facility, located 1.5 km to the northwest of the northern end of the pipeline, and 1.2 km southwest of SP1239.

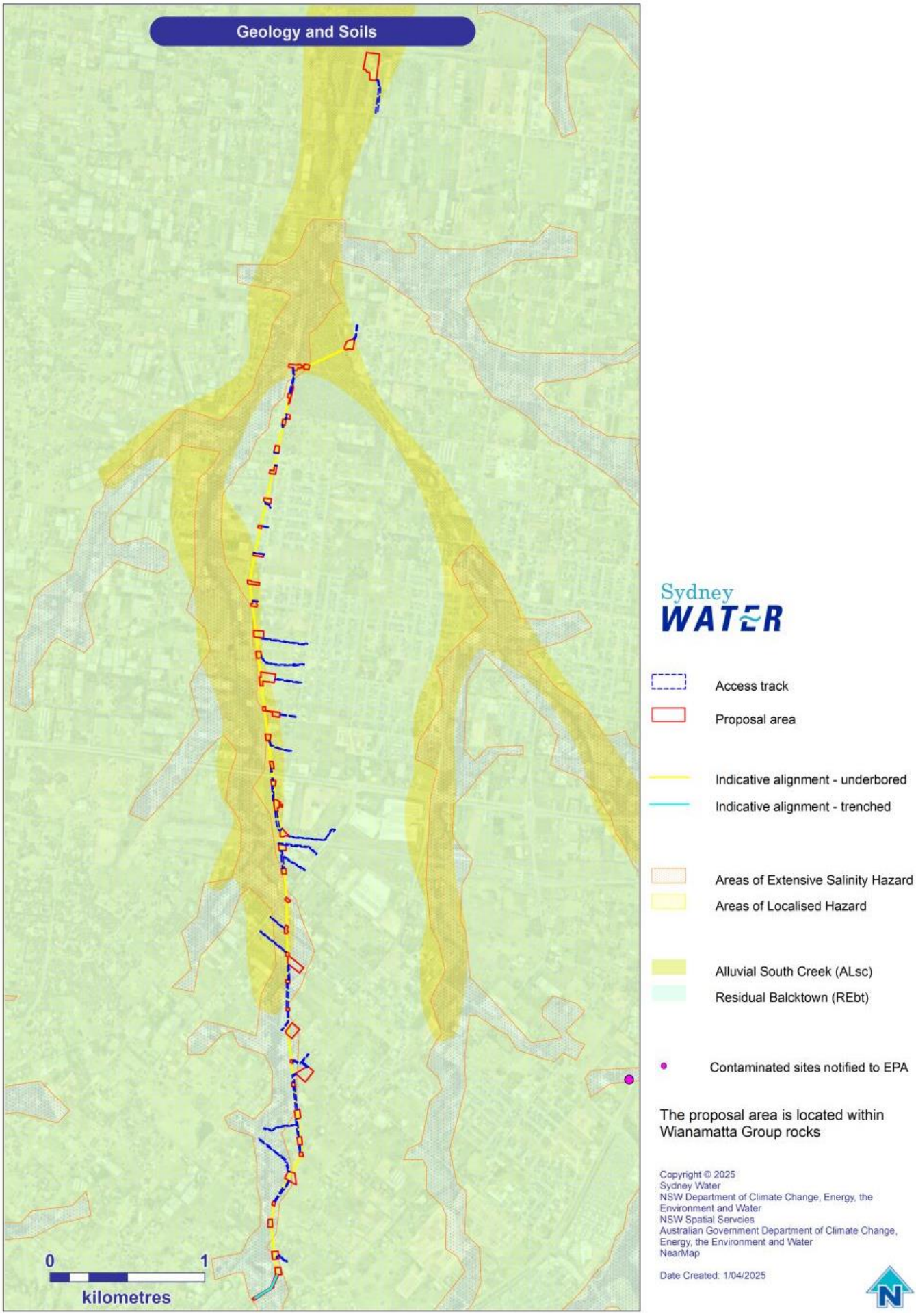


Figure 6-1 Overview of geology and soils

Construction impacts

During construction, the proposal would involve ground disturbance, vegetation removal, excavation and soil stockpiling. This could result in erosion and sedimentation of surrounding land and waterways.

Launch and receival shaft excavations would be about 8 m by 8 m wide and up to 17 m deep at the lowest point. The trench widths would be about 13 m wide. However, the Delivery Contractor may vary the trench width depending on the depth of the pipe and trench stabilisation method. Excavation would also be required to construct the pump station wet well. The volume of excavated material from SP1239, launch and receival shafts and open trenching is expected to be about 30,000 m^3. Excavations may temporarily alter localised surface topography and drainage conditions. The impacts of surface water drainage and flooding are assessed in section 6.2.2.

Excavated material would be temporarily stockpiled on site before being used to backfill or disposed of offsite at an appropriately licensed waste facility. Rainfall or high wind would potentially erode stockpiled material or excavated areas, resulting in runoff into adjacent land and waterways. Excavated material would be stockpiled as far as practicable from waterways to minimise potential erosion and runoff impacts.

The disturbance of saline soils has the potential to impact the local environment, including water quality and vegetation, if not managed appropriately.

Construction activities would be staged to minimise the extent of soil disturbance at any given time and disturbed areas would be stabilised, progressively backfilled and reinstated as soon as practical to a condition similar to that prior to the disturbance. Erosion and sediment controls would be implemented to prevent the migration of sediment downstream of the work site, especially where excavating in close to waterways.

The contaminated sites identified in the EPA contaminated land record of notices are located a distance from the proposal area and would be unlikely to affect the proposal.

The sites identified in the POEO public register are generally clean up notices relating to dumping and fill. Provided the proposal footprint is outside of the listed properties on the POEO register, it is unlikely to encounter significant amounts of contaminated soils.

The Kemps Creek RFS facility is undergoing ongoing monitoring. It is located on the other side of the Kemps Creek waterway to the proposal and is downstream of most of the proposal area. As such, groundwater or soils contaminated with PFAS may potentially be encountered within the proposal area (Aurecon Arup, 2024).

Due to previous land uses there is high potential to encounter contamination during construction. Any unexpected contamination encountered during earthworks and construction would be managed by the below mitigation measures, which must be included as part of the Delivery Contractor's CEMP.

Operation impacts

The proposal area would be returned to its original topography following construction where possible. Some changes to topography would occur at SP1239 as the facility and its access driveway would be raised above the 1 in 100 year annual exceedance probability (AEP) flood level. Higher levels of salinity may increase maintenance requirements and decrease the lifespan of the proposal due to the potential corrosive effects. Salt-resistant materials would be considered during detailed design.

Maintenance works would be carried out according to maintenance schedules or in response to emergencies. Work during operation would likely occur at the maintenance holes to access the pipes or at the pump station. These areas would be accessible via nearby roads and easements. Work during the operational phase are unlikely to involve tree removal or major ground disturbing work, such as open trenching. These works would generally be minor and be unlikely to have more than a minor impact on topography, geology or soils.

Mitigation measures

With the implementation of the mitigation measures below, impacts to topography, geology and soils during construction and operation can be adequately managed. Residual impacts are expected to be minor and temporary.

Table 6-1 Environmental mitigation measures — topography, geology and soils

Mitigation measures
Consider salt-resistant materials during detailed design.
Conduct contamination, geotechnical and groundwater investigations during detailed design to ground truth existing ground conditions.
Prevent sediment moving offsite in accordance with Managing Urban Stormwater, Soils and Construction, Volume 1 and 2A (Landcom 2004 and DECC 2008), including: • develop a Soil and Water Management Plan (SWMP) as part of the CEMP • divert surface runoff away from open trenches, disturbed soil and stockpiles • install sediment and erosion controls before construction starts • reuse topsoil where possible and stockpile separately • erosion and sediment mitigation devices are to be maintained in good working order • 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.
Include a Stockpile Management Plan (SMP) as part of the SWMP to adequately manage any proposed temporary and permanent stockpiles. This would include detail on: • exact location of stockpiles • minimising stockpile size • height, slopes and batters preventing mixing and cross contamination • consideration of future maintenance • capping • erosion and sediment control

Mitigation measures
• restoration. The SMP will be prepared by the Delivery Contractor and approved by the Sydney Water Project Manager in consultation with the Environmental Representative and the Sydney Water Contamination and Hazardous Materials team.
Minimise ground disturbance and stabilise disturbed areas progressively. Disturbed areas to be progressively backfilled and reinstated as soon as practical to a condition similar to that prior to the disturbance.
The Delivery Contractor is to ensure imported material is Virgin Excavated Natural Materials 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 an NSW EPA Resource Recovery Order / Exemption, the Delivery Contractor must ensure the conditions in that Order / Exemption are strictly adhered to.
Stop work in the immediate vicinity of suspected contamination. Indicators of contamination include discoloured soil, anthropogenic fill material, asbestos, strong 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 would contact Contamination and Hazardous Materials team) to agree on proposed management approach.
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, and before rainfall.
Eliminate ponding and erosion by restoring natural landforms to the pre-works condition.
Confine vehicle and machinery movement to designated tracks, pathways and work areas and keep to sealed areas where possible.
Adopt appropriate soil salinity mitigation measures in accordance with the Western Sydney Salinity Code of Practice (Western Sydney Regional Organisation of Councils, 2003). This may include: • treat existing salinity with gypsum • establish salt tolerant species in existing or potential salinity problem areas after construction • stabilise existing areas of erosion • minimise water use on site • avoid rotation and vertical displacement of the original soil profile • backfill excavations deeper than one metre in the same order, or treat or use this material as fill at depths more than one metre from the finished level.
Stockpile excavated material as far as practicable from waterways to minimise potential erosion and runoff impacts.

Mitigation measures
In line with Transgrid's conditions of approval, stockpiles and temporary storage of construction material is not to occur within the easement.
In line with Transgrid's conditions of approval, install settlement monitoring devices and monitor for 6 months.

6.2.2 Water and drainage

Existing environment

Surface water

The proposal alignment generally follows the Kemps Creek waterway. The proposal's connection point to the existing Phase 1 pipeline is adjacent to Bonds Creek. Both creeks are part of the Hawkesbury-Nepean river system. Bonds Creek joins Kemps Creek about 400 m north of the connection point. Kemps Creek continues north and discharges into South Creek about 9 km north of the proposal. South Creek continues north and joins the Hawkesbury-Nepean River about 36 km north of the proposal. There are several minor man-made reservoirs, ponds or dams in the proposal area.

The proposal alignment is generally located at a low point in the landscape particularly the sections closer to Kemps Creek. As such, surface water likely flows towards Kemps Creek.

Water quality in Kemps Creek is likely to be largely influenced by stormwater runoff.

Flooding

The proposal is partly located within mapped flood prone areas.

Available flood mapping from Liverpool City Council's e-planning viewer indicate the following:

- SP1239 may be flooded during 1% AEP flood events.
- The proposal area between Thirteenth and Twelfth Avenue may be flooded during 1% and 5% AEP flood events.
- Proposal areas between Twelfth Avenue and Boyd Street may be flooded during 1% AEP flood events.
- Proposal areas between the southern end of Boyd Street to Bringelly Road are generally within the indicative extent of 1% or 5% AEP flood events.

Available flood mapping viewed on Camden Council's IntraMaps viewer indicate the following:

- Proposal areas between Bringelly Road and Riley Road generally appear to be within the indicative extent of 1% AEP flood events.
- Some proposed access tracks are near George Road and Philip Road are within the indicative extent of 1% AEP flood events.

Groundwater

There is potential for groundwater to be encountered, particularly in the vicinity of waterways. Groundwater field investigations in the proposal area would be conducted during the detailed design phase to confirm standing groundwater levels and groundwater dewatering calculations. Based on groundwater investigations for Phase 1 of the project, it is expected that groundwater would be shallower near waterways and deeper in areas of relatively higher elevation.

Construction impacts

During construction, the proposal would involve vegetation removal, excavation and the establishment of temporary soil stockpiles and fuel and chemical storage areas. The main construction impacts on water and drainage include erosion, sedimentation and accidental spills and leaks.

Surface water

During construction, there may be minor changes in topography and impervious areas however works are unlikely to significantly obstruct or redirect flows.

Vegetation removal and excavation activities near the Kemps Creek waterway would increase the risk of sediment runoff and erosion. Work in the creek would be limited to establishing access roads that cross the waterway, if required. Sediment entering into waterways have the potential to cause turbidity which could decrease light levels for submerged aquatic vegetation and smother benthic organisms. Following the implementation of mitigation measures, potential run off is unlikely to deteriorate downstream water quality or exacerbate erosion and sedimentation.

Spills and leaks from plant and equipment or inappropriate storage of fuels and chemical have the potential to enter Kemps Creek. In general, small quantities of fuels and other chemicals would be used on site including diesel generators, plant and machinery. This could potentially result in a decline in local water quality. No bulk storage of fuels and chemicals is proposed. The potential for spills and downstream impacts would be minimised through the implementation of mitigation measures.

The use of trenchless construction minimises impacts to surface water drainage patterns compared to open trenching. To minimise adverse impacts to water quality, pipe creek crossings would be performed using trenchless methods. No pipe creek crossings would be completed using open trenching. Two short sections of open trenching at the northern and southern end of the alignment would be required which may temporarily disturb surface water flows towards the Kemps Creek waterway particularly during wet weather conditions. Mitigation measures would be in place to minimise impacts to flow volumes and water quality. Any dewatering required would be carried out in line with Sydney Water's Discharge Protocol. The land would be restored following construction in accordance with the mitigation measures below.

Trenchless construction has a potential risk of fluid (water and slurry) escaping the bore and entering the environment from a spill or frac-out (drilling intercepting faults and fractures in the rock). If not adequately managed, construction in or near waterways has the potential to cause sedimentation and impact water quality. Frac outs are unlikely to occur, provided the drilling contractor implements the mitigation measures and manages drilling to minimise the risk of frac-out.

Flooding

The proposal is not likely to adversely affect flood behaviour given the works would not permanently change surface topography and drainage patterns to a significant degree. During periods of high rainfall, higher water levels in the creeks and localised flooding may impact on construction. Flooding has the potential to increase soil erosion and sedimentation from the construction site particularly where excavation and stockpiling occur in flood prone areas. Pollutants such as sediment, soil nutrients, construction waste, chemicals and gross pollutants have the potential to enter the waterway, particularly during high rain events, which potentially could result in a decline of water quality. Poor site management may lead to potential sedimentation impacts to the Kemps Creek waterway.

Potential impacts from flooding would be limited by:

- the progressive nature of construction along the alignment
- placing the stockpiles outside of flood prone areas far as practicable
- mitigation measures to avoid, mitigate and manage potential impacts in the event of flood.

Groundwater

Given the proposal generally follows the creek, groundwater is expected to be shallow and is therefore likely to be encountered during construction. A Water Supply Work Approval would be required for groundwater dewatering. The volume of dewatered groundwater would be assessed during the detailed design phase and a Water Access Licence would also be sought if the dewatering volume is likely to exceed 3 ML. Any groundwater and/or water captured in excavations that requires dewatering would be pumped out, treated and released on site in accordance with Sydney Water's Discharge Protocols. There are potential opportunities to reuse water and reduce the volume of water discharging into the environment such as recycling and reusing slurry water for microtunnelling. Impacts associated with dewatering excavations, such as the management of sediment-laden construction water, would be temporary and manageable with mitigation measures.

The proposed work is in an area that contains aquatic and terrestrial Groundwater Dependent Ecosystems (GDEs) according to the Bureau of Meteorology's GDE Atlas. The terrestrial GDEs are generally confined to the vegetation adjacent to the Kemps Creek waterway. There may be some minor impacts to aquatic and terrestrial GDEs during the construction of access tracks (largely upgrading of existing driveways) to provide access to the proposal areas. Dewatering would reduce the availability of groundwater on which these ecosystems depend. However impacts would be reduced through discharging water back into the environment (in accordance with the mitigation measures). These ecosystems are unlikely to be significantly impacted as groundwater levels are unlikely to be significantly altered by the proposal.

Operational impacts

During commissioning, water from testing the pipelines and structures would be tested before being discharged. Any discharge would be carried out in accordance with the mitigation measures and follow the Sydney Water Discharge Protocol. Opportunities to reduce impacts to downstream water quality, scour and sedimentation due to discharging water would be explored in future project stages.

During operation, maintenance works would be carried out according to maintenance schedules or in response to emergencies. Work during operation would likely occur at the maintenance holes to access the

pipes. The pipelines would be buried and are not expected to significantly impact flood behaviour. SP1239 and its access driveway from Gurner Avenue would be raised above the 1 in 100 year AEP flood level. This may impact flood behaviour where the raised ground levels may cause surface waters to flood the area to the east of SP1239. However, impacts may be mitigated by a potential stormwater retention basin planned by Liverpool City Council east of the SP1239 site.

Other design elements would be considered during detailed design and with ongoing consultation with Liverpool City Council to minimise potential flooding impacts and changes to surface water flows during operation. Operational maintenance works may also occur at the pump station however activities are unlikely to significantly affect water and drainage.

The proposed pump station has been designed with a wet well which would store wastewater during wet weather events, preventing wastewater discharges into the environment most of the time. However, during extreme weather events, the wastewater storage capacity of the pump station may be exceeded. This may cause untreated wastewater to flow out from emergency relief structure points to avoid internal surcharges within customer's properties. During these overflow events, diluted wastewater would enter the creek, contributing to an increase in background nutrient loads, pathogen levels and trace pollutant loads. The impact of these temporary and infrequent wastewater discharges would be minimised by the large catchment flows that occur during extreme wet weather events. The proposal would initially operate under the Malabar EPL and ultimately under the future system Environmental Protection Licence (EPL) associated with the Upper South Creek AWRC.

Mitigation measures

With the implementation of the mitigation measures below, potential construction and operation impacts to water and drainage can be adequately managed. Residual impacts are expected to be minor and temporary.

Table 6-2 Environmental mitigation measures — water and drainage

Mitigation measures
Prepare a Drilling Fluid Management Plan to avoid impacts, including: • contain and monitor drilling fluids at entry/exit points • identify and manage frac-outs • recycle, reuse and/or disposal of drilling fluids (checking waste classification).
Explore potential opportunities to minimise the volume of water into the environment, including opportunities to reuse water.
Sydney Water will continue to consult with Liverpool City Council during detailed design to minimise potential flood impacts around the pump station during operation.
Explore options to access sites which would not require creek crossings.
Minimise the impacts to creeks where creek crossings are required.

Mitigation measures

The Delivery Contractor must consult with DPIRD in accordance with Part 7 of the FM Act about potential blockage to fish passage due to proposed construction access roads. The Delivery Contractor would obtain a permit for blockage of fish passage if required.

If any fish kills occur in the vicinity of the works, stop works and immediately notify DPIRD Fisheries (1800 043 536) and the EPA (131 555). Construction is not to recommence unless written approval from DPIRD Fisheries and the EPA has been received.

Bund potential contaminants and store on robust waterproof membrane, away from man-made dams and waterways. All chemicals and fuels to be stored, labelled, transported and used in accordance with Australian Standards, Safety Data Sheets and in line with best practices. Record stored chemicals on site register. Bunded areas to have 110% capacity of stored liquid volume. Chemicals and fuels in vehicles must be tightly secured. All chemicals to be clearly labelled.

Keep functioning spill kits on site for clean-up of accidental chemical/fuel spills. Keep the spill kits stocked and located for easy access.

Conduct any equipment, machinery or work vehicles wash down or refuelling in compounds away from waterways where possible. Maintain appropriate controls. If field refuelling or maintenance is necessary, designate an area away from waterways and drainage lines with functioning spill kits close by.

Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak-free item.

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. Keep stockpiles outside of flood prone areas where possible.

Locate portable site amenities, chemical storage and stockpiles of erodible materials away from man-made dams, the Kemps Creek waterway and its drainage lines and flood prone areas where possible.

A WSWA is required for groundwater extraction less than 3ML per water year (from 1 July). A WAL is required for groundwater extraction greater than 3ML per water year (from 1 July). Sydney Water will obtain a WSWA and WAL. The Delivery Contractor is responsible for:

- Preparing all application materials prior to construction and supplying these to Sydney Water with appropriate lead time. These application materials include, but are not limited to:
    - A Dewatering Management Plan, including type of location of pumps
    - Dewatering calculations, with appropriate justifications (i.e. groundwater assessment report, expert hydrogeological technical information)
    - Approval application form/s
- Complying with the conditions of the approvals (such as protecting water quality; minimising aquifer extraction volumes; monitoring extraction with flow meters and recording volumes).

No dewatering is to occur until the WSWA is obtained. No dewatering beyond 3ML is to occur until the WAL is obtained.

Mitigation measures
Dewater in accordance with Sydney Water Discharge Protocols and DPIRD recommendations. Appropriate methods are to be implemented including: • Conduct regular checks of the discharge location and downstream areas for possible soil erosion and flooding. • Conduct daily checks of the sediment levels in the dewatering sediment dams to ensure adequate storage capacity. • Ensure retention of spoil for a long enough period to allow mobilised sediments to settle out. • Ensure a slow rate of discharge is used or that dewatering occurs during wet periods to minimise stirring up sediments downstream. • Discharge through a geotextile sock or over an energy dissipater. • Have a spotter to conduct visual inspections of the waterway during dewatering to ensure that no visible plumes are generated within the waterway. • Re-use potable / groundwater water where possible.
Dewater excavations in accordance with the Delivery Management Guidance Standard 9.1 *Excavation Dewatering*.
Works to be conducted during low flows where possible.

6.2.3 Flora and fauna

Potential flora and fauna impacts were identified through desktop assessments and on-site investigations. A specialist assessment report was prepared by GHD to support this REF and is attached as Appendix C – Biodiversity Assessment Report (GHD, 2025). Parts of the proposal were also surveyed for Phase 1 of the project and these results were considered where relevant.

Existing environment

Vegetation

Existing vegetation communities were ground-truthed during field surveys. There are plant community types (PCTs) within the proposal area which are protected under the BC and/or EPBC Act. These include patches of PCT 3320 Cumberland Shale Plains Woodland, PCT 4025 Cumberland Red Gum Riverflat Forest and PCT 3975 Southern Lower Floodplain Freshwater Wetland. Figure 4-1 in Appendix C – Biodiversity Assessment Report provides an overview of PCTs and other mapped vegetation categories. Figure 4-2 in Appendix C – Biodiversity Assessment Report provides an overview of ground-truthed ENV (refined ENV) and are reproduced in Figure 6-2 to Figure 6-5 below.

ENV

There are many patches of vegetation mapped as Existing Native Vegetation (ENV) throughout the proposal area. These patches of ENV support River-flat Eucalypt Forest and Cumberland Plain Woodland vegetation.

Patches of ENV were refined to exclude areas that did not meet the definitions in the BCO. Areas excluded included hardstand areas such as roads and driveways, and areas that did not support native vegetation or had a canopy cover of less than 10%.

Habitat features

Hollow bearing trees were recorded during the field surveys. However, no hollow bearing trees were found within the proposal area during the field surveys. Some parts of the proposal area were not accessed during the field survey and may contain hollow-bearing trees. These could support suitable breeding habitat for woodland birds, arboreal mammals, microbats and forest owls.

Threatened fauna

No threatened fauna species were identified during the field surveys. There was one threatened species recorded during previous field surveys conducted for Phase 1, the Grey-headed Flying-fox (*Pteropus poliocephalus*). Additionally, multiple fauna species have been previously recorded in the wider area. Threatened fauna that are likely to occur within the proposal area include:

- Cumberland Plain Land Snail
- Microbats including Eastern False Pipistrelle, Eastern Coastal Freetail Bat, Southern Myotis and the Greater Broad-nosed Bat
- Grey-headed Flying-fox.

Threatened flora

No threatened flora species were identified during the field surveys, nor have any been recorded within the proposal area in the past. However, six threatened flora species were considered to have the potential to occur:

- *Acacia pubescens*
- *Grevillea juniperina* subsp. *juniperina*
- *Marsdenia viridiflora* R. Br. subsp. *viridiflora* population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas
- *Persoonia nutans*
- *Pimelea spicata*
- *Pomaderris brunnea.*

Weeds

The field surveys identified a number of weed species including:

- African Olive
- Bridal Creeper
- Prickly Pear
- Lantana
- African Boxthorn

- Blackberry
- Fireweed
- Green Cestrum.

Additionally, Kemps Creek Nature Reserve on the northern boundary of the proposal area at SP1239 has been closed since September 2017 in response to a Phytophthora outbreak (NPWS 2017). Phytophthora may result in the dieback or modification of native vegetation and damage to fauna habitats. Phytophthora is present at the proposed location of SP1239.

Key Fish Habitat

Kemps Creek and Bonds Creek are mapped as Key Fish Habitat however the biodiversity assessment report found that the proposal area does not contain any watercourses that provide suitable habitat for threatened fish listed under the FM Act.

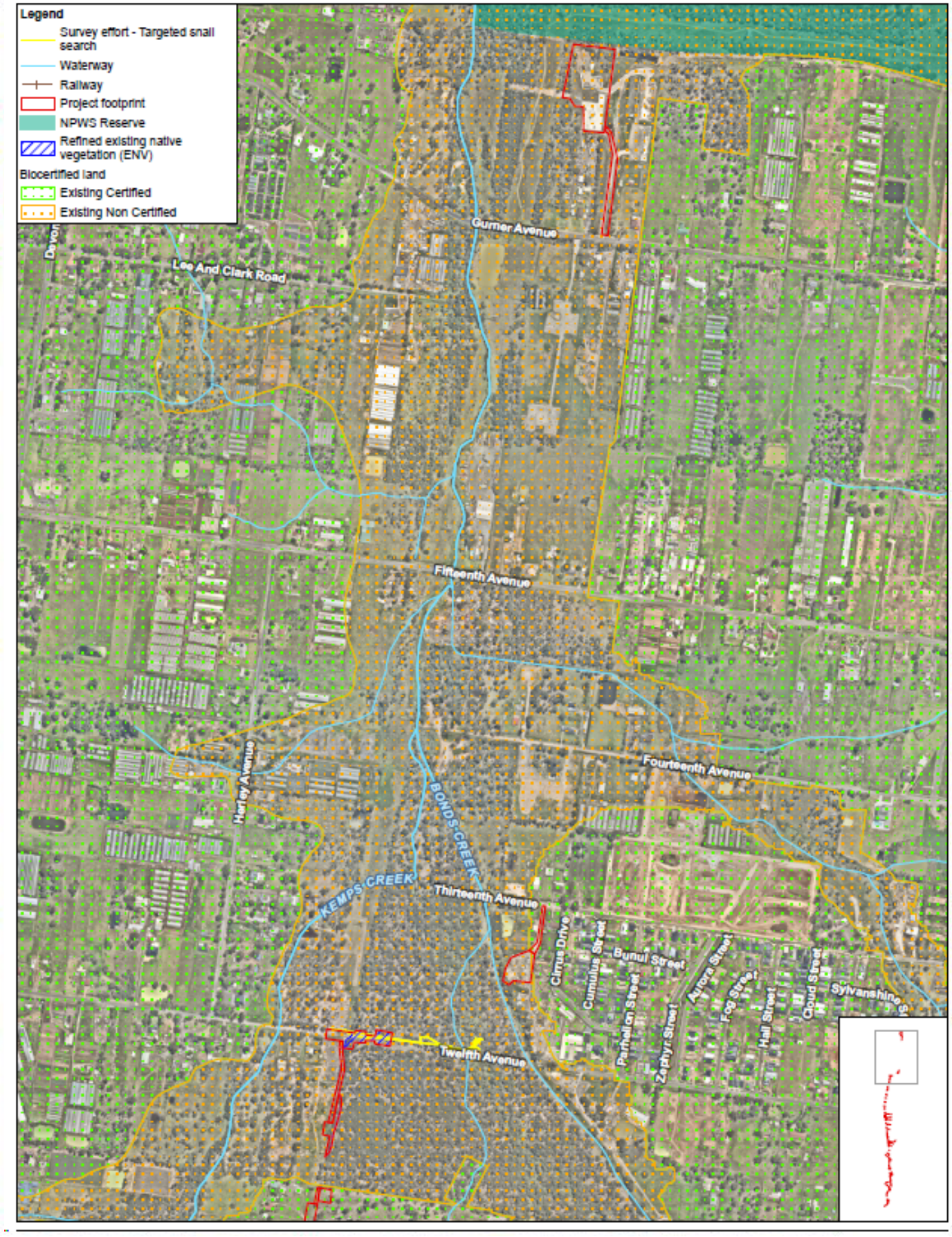


Figure 6-2 Ground-truthed (refined) ENV and ecological constraints

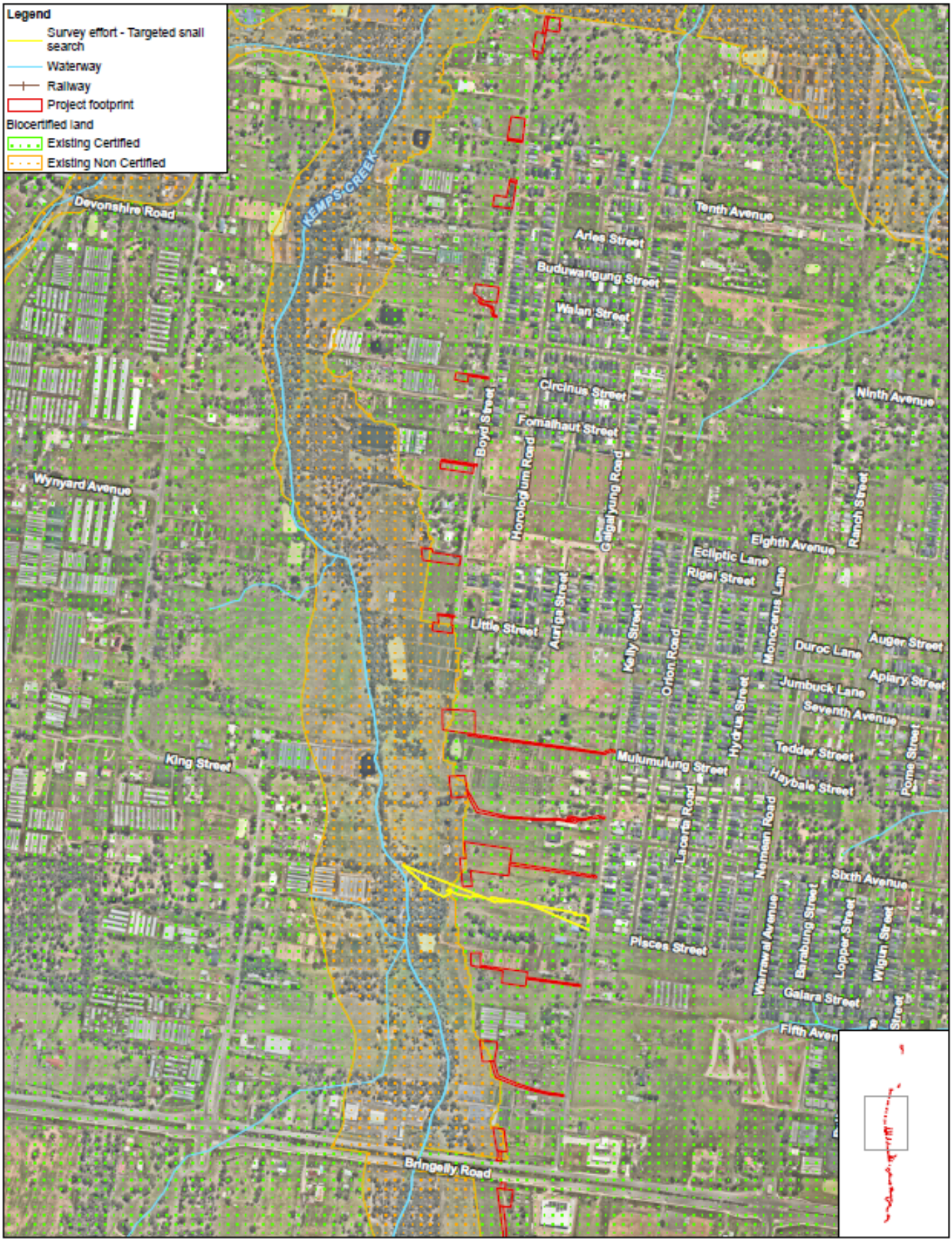


Figure 6-3 Ecological constraints

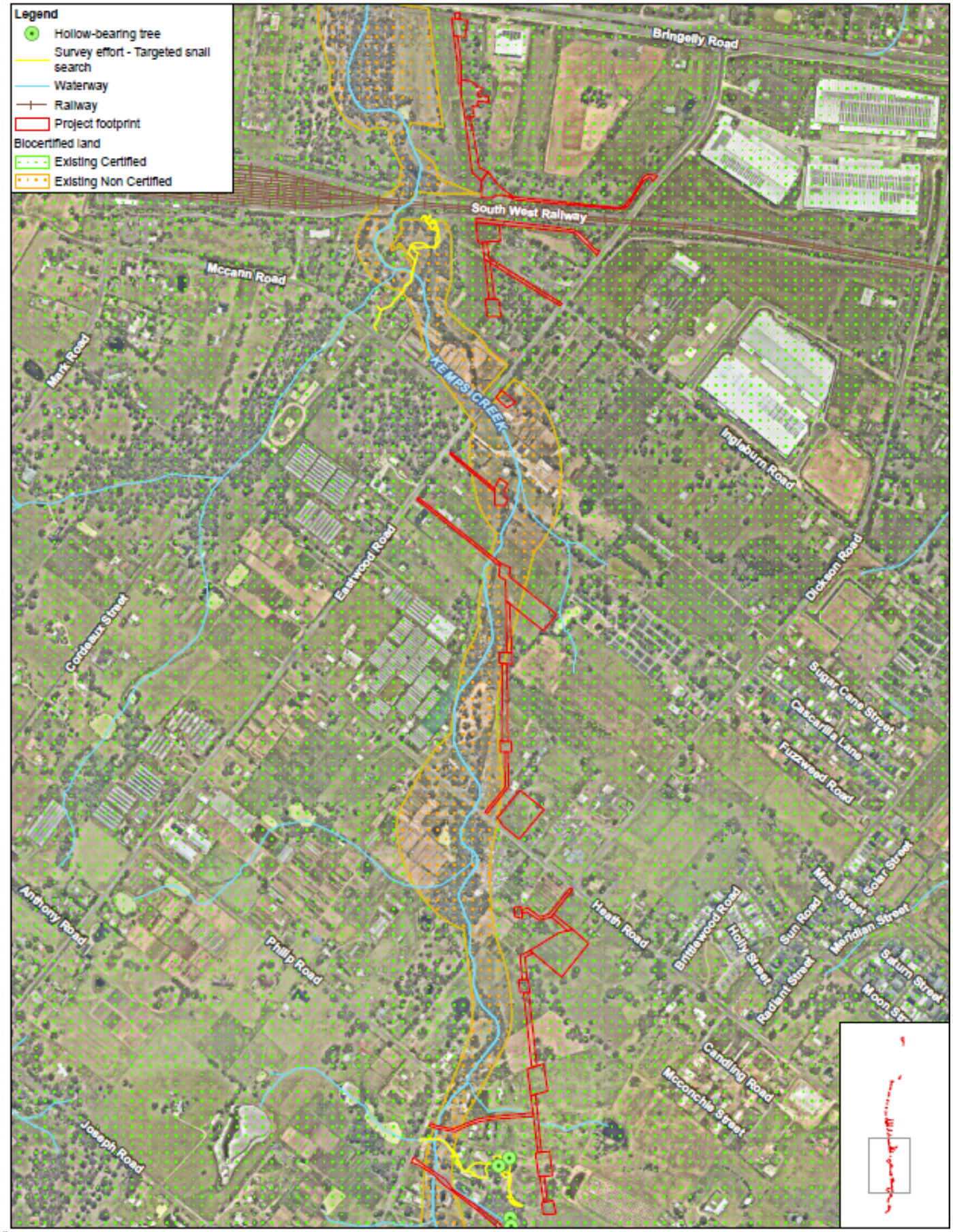


Figure 6-4 Ecological constraints



Figure 6-5 Ecological constraints

Construction impacts

During construction, the potential impacts on biodiversity would be primarily due to vegetation clearing with associated impacts on habitat for threatened flora and fauna species.

Vegetation

Clearing would remove localised patches of vegetation. Up to 8.9 ha of vegetation would be removed within the proposal area. Of this, 1.84 ha constitutes native vegetation, with 0.88 ha within certified land and 0.96 ha within non-certified land. Minor trimming of adjacent vegetation may also be required to manage overhanging branches where present. The estimated amount of vegetation removal is summarised in Table 6-3 below.

Table 6-3 Vegetation clearing within the proposal area

Vegetation type	BC Act-listed threatened ecological community	EPBC Act-listed threatened ecological community	Certified lands (ha)	Non-certified land (ha)	Total (ha)
PCT 3320 - Cumberland Shale Plains Woodland – high condition	Cumberland Plain Woodland in the Sydney Basin Bioregion	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	0	0.30	0.30
PCT 3320 - Cumberland Shale Plains Woodland – moderate condition	Cumberland Plain Woodland in the Sydney Basin Bioregion	Not listed	0.50	0.49	0.99
PCT 4025 - Cumberland Red Gum Riverflat Forest – high condition	River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions	River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	0.26	0.10	0.36
PCT 4025 - Cumberland Red Gum Riverflat Forest – moderate condition	River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions	Not listed	0.09	0.06	0.15
PCT 3975 - Southern Lower Floodplain Freshwater Wetland – poor condition	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney	Not listed	0.03	0.01	0.04

Vegetation type	BC Act-listed threatened ecological community	EPBC Act-listed threatened ecological community	Certified lands (ha)	Non-certified land (ha)	Total (ha)
	Basin and South East Corner Bioregions				
Exotic grassland	N/A	N/A	5.99	1.07	7.06
Total vegetation clearing (including exotic grassland) (ha)			6.87	2.03	8.9
Total vegetation clearing (native vegetation only) (ha)			0.88	0.96	1.84

The impacts to Cumberland Plain Woodland, River-flat Eucalypt Forest and Freshwater Wetlands were assessed in accordance with section 7.3 of the BC Act under a '5-part test'. The tests concluded that the proposal would not have a significant impact on the threatened ecological communities and therefore a Species Impact Statement (SIS) or Biodiversity Development Assessment Report (BDAR) are not required (refer Appendix C – Biodiversity Assessment Report).

Similarly, the impacts to Cumberland Plain Woodland and River-flat Eucalypt Forest 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 local or regional impact on Cumberland Plain Woodland and River-flat Eucalypt Forest. As such, a referral to the Commonwealth Minister for the Environment for determination is not required (refer Appendix C – Biodiversity Assessment Report).

Clearing native vegetation within certified areas has already been offset under the BCO. Sydney Water will voluntarily offset non-ENV vegetation within non-certified land in accordance with the Sydney Water Biodiversity Offset Guide (SWEMS0019.13). As such, an offset multiplier of 3 would be applied. Voluntary offset calculations for the proposal are as follows:

- Clearing of 0.58 ha of Cumberland Plain Woodland, resulting in an offset requirement of 1.74 ha.
- Clearing of 0.16 ha of River-flat Eucalypt Forest, resulting in an offset requirement of 0.48 ha.
- Clearing of 0.01 ha of Freshwater Wetlands, resulting in an offset requirement of 0.03 ha.

Revegetation would be prioritised on site where possible and would be carried out in consultation with landowners and stakeholders. There would be a temporary and localised impact to native vegetation however revegetation would provide an overall positive impact to the environment.

ENV

The proposal would impact 0.22 ha of ENV within non-certified land. This is made up of 0.15 ha of high condition Cumberland Shale Plains Woodland and 0.07 ha of moderate condition Cumberland Shale Plains Woodland. ENV impacts would require statutory offsets under the BCO.

Habitat features

If hollow bearing trees are to be removed, Sydney Water's Biodiversity Offset Guide (SWEMS0019.13) would be implemented which requires the reinstatement of two hollows per hollow removed. Hollows would

be salvaged and reused over nest boxes where possible. All other identified hollow bearing trees and stag trees would be avoided where possible. As such, the removal of habitat features would have a minor and temporary impact on fauna and an overall positive impact.

Threatened flora and fauna

The potential impacts to Cumberland Plain Land Snail and tree-roosting microbats were assessed in accordance with section 7.3 of the BC Act under a '5-part test'. The tests concluded that the proposal would not have a significant impact on these species and therefore a SIS or BDAR are not required (refer Appendix C – Biodiversity Assessment Report).

Much of the surrounding area has been subject to clearing for rural residential and agriculture development and associated disturbances. The area is also subject to weed invasion, edge effects and changed hydrological regimes, and does not represent suitable habitat for many threatened flora species predicted to occur.

Construction activities may temporarily disturb local fauna. There is also the potential for direct strikes to fauna from machinery and vehicles. Lizards and frogs could also fall into open trenches and become trapped if left open overnight during construction. More mobile fauna displaced during construction activities would likely seek refuge in areas of adjoining habitat.

With the implementation of mitigation measures, the proposal is unlikely to significantly impact flora and fauna species.

Weeds

Construction activities have the potential to result in the spread of weed species as well as the spread of plant pathogens, such as *Phytophthora cinnamomi*. These potential impacts would require management through the mitigation measures presented below. The Kemps Creek Nature Reserve and the location of SP1239 are known to contain *Phytophthora cinnamomi.* Work between Gurner Avenue and the Kemps Creek Nature Reserve has potential to encounter and spread the pathogen. Hygiene controls to prevent *Phytophthora cinnamomi* spread have been implemented during the construction of SP1211 in Phase 1. The hygiene management plan from Phase 1 aligns with the Hygiene Guidelines for Wildlife (DPIE 2020) and would continue to be implemented during construction of SP1239.

Key Fish Habitat

Construction activities around waterways may have potential impacts on aquatic habitat, including Key Fish Habitat. Habitat features such a debris, snags and/or riparian vegetation would potentially be disturbed. Key Fish Habitat is unlikely to be impacted by the drilling of the pipes however habitat features may be disturbed during construction of creek crossings for access to launch and receival sites. Fish passageways would be maintained at all times and the waterway would not be blocked by any construction activity. Threatened species under the *Fisheries Management Act 1994* are unlikely to be affected (refer Appendix C – Biodiversity Assessment Report). Mitigation measures to avoid, mitigate and manage potential impacts to aquatic habitat, including Key Fish Habitat, are provided below. Potential erosion, run off and sedimentation impacts to waterways are assessed in sections 6.2.1 and 6.2.2.

Operational impacts

During operation, no direct impacts are anticipated on vegetation communities, flora or fauna. Indirect operational impacts to biodiversity may result from noise disturbance during maintenance works however these would generally occur during standard day time hours and would be temporary. Other operational impacts may include the risk of bushfire. However this is considered low as the above ground infrastructure (such as ventilation shafts and the pump station) would generally be clear of surrounding vegetation. As such, operational works are unlikely to involve vegetation clearing, would generally be minor and would be unlikely to have more than a minor impact on biodiversity.

Mitigation measures

With the implementation of the mitigation measures below, potential construction and operation impacts to flora and fauna can be adequately managed. Residual impacts are expected to be minor and temporary.

Table 6-4 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 REF).
Written explanation of the application of this clause (including justification of the need for trimming or removal and any proposed revegetation) would be provided by the Delivery Contractor when seeking Project Manager approval. Any impacts to native vegetation and trees must be offset in accordance with the Biodiversity Offset Guide (SWEMS0019.13).

Prepare a CEMP which includes: • maps of the approved vegetation disturbance areas • management measures to prevent impacts on environments adjacent and downstream of the proposal.
Maintain fish passage in the waterway at all times. Remove these measures once the site has been stabilised and risk of sediment movement is minimal. If fish passage will be blocked, the Delivery Contractor would acquire a permit from DPIRD Fisheries before works commence.

Mitigation measures

Manage biosecurity in accordance with the *Biosecurity Act 2015* (see NSW Weedwise), including:

- reporting new weed infestations or invasive pests
- wrap straw bales in geofabric to prevent seed spread
- contemporary bush regeneration practices, including disposal of sealed bagged weeds to a licenced waste disposal facility.

If herbicide is to be used, this must be applied by a person trained to do so and that has a certificate of competency, or a statement of attainment issued by a registered training organisation. Herbicide will only be used in accordance with the label/permit. Record Pesticides and Herbicides use in accordance with SWEMS0017.

To prevent spread of weeds:

- conduct toolbox talks to identify high risk priority weeds to onsite staff
- ensure all equipment including personal protective equipment (PPE) is visibly clean of plant and soil material prior to entering and leaving site (vehicle cleaning can occur in a designated location in the construction compound/laydown area)
- establish exclusion zones around retained areas of native vegetation
- manage any priority weeds according to the requirements of the *NSW Biosecurity Act* 2016
- when clearing and trimming, separate all plant parts that may be infested with weeds and weed propagules and dispose at a licensed waste disposal facility.

To prevent spread of pathogens such as Phytophthora:

- ensure measures are consistent with the Hygiene Guidelines for Wildlife (DPIE 2020)
- conduct toolbox talks to onsite staff to identify risk of spreading pathogens
- ensure all equipment including personal protective equipment (PPE) is visibly clean of plant and soil material prior to entering and leaving site (vehicle cleaning can occur in a designated location in the construction compound/laydown area)
- provide machine and footwear washdown stations for all equipment and personnel working in areas of native vegetation
- minimise work near Kemps Creek Nature Reserve when the soil is waterlogged
- work under the assumption that the proposal area is free of the disease and therefore needs to be protected against infection, and that the activity has the potential to introduce the disease
- follow the Sydney Water Phytophthora Management Plan for Gurner Avenue, Austral which outlines measures to reduce the risk of Phytophthora spreading to uncontaminated areas (Blue Tongue Ecosystems 2022).

Mitigation measures

Provide all workers with an environmental induction prior to starting construction activities on site. This would include information on the ecological values of the site and protection measures to be implemented to protect biodiversity during construction.

A suitably qualified ecologist will conduct a pre-clearance survey for the presence of flora and fauna, and will supervise the clearing of all hollow bearing trees. Pre-clearing surveys should include:

- surveys for Cumberland Plain Land Snail
- surveys for microbats.

If any threatened flora species are identified, they will be flagged and the individuals and their habitat protected where possible.

Prior to clearing vegetation, the ecologist will physically delineate vegetation to be cleared and/or protected on site using flagging tape or similar, and install appropriate signage. Fencing and signage must be maintained for the duration of the construction period. Fencing will be designed to allow fauna to exit the site during clearing activities.

Inspect vegetation for potential fauna prior to clearing or trimming. If fauna is present, allow it to move away unharassed. If nests or dreys (i.e. a small round nest made from a thicket of sticks) are present, engage WIRES or a licenced ecologist to inspect and relocate fauna before works.

Where possible, site laydown areas to be:

- located at least 15 m away from protected trees, in accordance with the requirements of Australian Standard 4970-2009
- within open grassed mapped as ‘urban natives and exotics’ or on areas with hard stand surfaces.

Minimise vegetation clearance and disturbance, including impacts to standing dead trees and riparian zones. Minimise impacts on native vegetation in non-certified areas. Where possible, limit clearing to trimming rather than the removal of whole plants.

Clearing of mature and hollow-bearing trees will be avoided where possible. Any hollow-bearing trees identified during pre-clearing surveys or prior to construction will be retained in-situ to allow fauna to self-relocate. If clearing is unavoidable, hollows will be salvaged and offset in accordance with Sydney Water’s Biodiversity Offset Guide.

In areas of intact native vegetation, large pieces of fallen timber (e.g. with a diameter of >20cm) within the project footprint will be salvaged and left in situ following construction, where practical.

Retain dead tree trunks, bush rock or logs in-situ unless they are in the disturbance corridor and moving is unavoidable. Reposition material elsewhere on the site or approved adjacent sites.

Protect trees in accordance with the requirements of Australian Standard 4970-2009 for the Protection of Trees on Development Sites. This includes the habitat trees adjacent to the proposal area. Tree Protection Zones to be established on retained vegetation or large trees adjacent to work areas. Do not damage tree roots unless absolutely necessary, and engage a qualified arborist where roots >50 mm are impacted within the Tree Protection Zone.

Mitigation measures
Protect trees in accordance with the Program Delivery Guidance Standard 9.3 Biodiversity Management (ENV-GS-003).
Potentially affected residents will be notified of any tree removal.
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. The Delivery Contractor would adopt the Sydney Water Unexpected Finds procedure.
If native fauna is encountered on site, stop work and allow the fauna to move away unharassed. Engage WIRES, a local wildlife rescue service or a licenced ecologist if assistance is required to move fauna.
Where practical, open trenches will be covered at the end of each work day to avoid potential for native fauna to become trapped in open trenches. Open trenches will be checked each morning, before the start of construction to salvage any fauna that have fallen in, and move them to a safe and appropriate nearby location.
For works in Key Fish Habitat or waterways, on completion, all disturbed soil will be levelled, smoothed and sown with a mixture of sterile/native grass seeds to encourage rapid revegetation and planted out with native endemic riparian vegetation.
Sydney Water will offset the ENV clearing at a ratio of 3:1 in accordance with the BCO. Sydney Water has sufficient credits to offset the proposed impact to ENV. The offset credits are from Western Sydney Parklands in the growth centres. The credits would be retired once the exact ENV clearing is verified.
The Delivery Contractor will offset residual impacts to native vegetation and trees in accordance with the Biodiversity Offset Guide (SWEMS0019.13) and as outlined in Appendix C – Biodiversity Assessment Report.
If replanting near Sydney Water pipelines refer to *'Which trees can damage wastewater pipes?'* from the Sydney Water website.
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.
If any damage occurs to vegetation outside of the proposal area, notify the Sydney Water Project Manager and Environmental Representative so that appropriate remediation strategies can be developed.
In TOBAN period: A Total Fire Ban Exemption is required for all non-essential work in TOBAN periods. Staff and contractors should use the Sydney Water Total Fire Ban Exemption Framework to determine exemption permissibility and approval pathway.

6.2.4 Aboriginal heritage

Potential Aboriginal heritage impacts were identified through desktop assessments and on-site investigations. A specialist assessment report was prepared by KNC to support this REF and is attached as Appendix D – Aboriginal Heritage (KNC, 2024).

Existing environment

A search of the Aboriginal heritage information management system (AHIMS) database and a review of prior Aboriginal heritage studies identified several Aboriginal heritage sites in the region. The identified sites are artefacts, potential archaeological deposits (PADs) and an Aboriginal Resource and Gathering site. There is generally low archaeological potential within the proposal area due to topography, flooding, erosion and disturbance from land use practices.

Identified archaeological features are mapped below in Figure 6-6 and Figure 6-7.

Four AHIMS sites are located within the proposal area:

- AHIMS [redacted] surface artefact scatter, listed as destroyed
- AHIMS [redacted] isolated surface artefact
- AHIMS [redacted] isolated surface artefact
- AHIMS [redacted] PAD.

This information has been redacted to protect sensitive Aboriginal heritage

The proposal area also overlaps with 4 Aboriginal Heritage Impact Permit (AHIP) sites:

- AHIP 4701, Kelly Street Residential Subdivision, expires 21 December 2025
- AHIP 4938, South West Growth Area Eastern Front and Liverpool Area – Phase 1 Package 2 Austral, expired 17 June 2024
- AHIP 5202, Kemps Creek Pressure Main, expires 19 April 2029
- AHIP C0000436, Bringelly Road Upgrade, expired 09 April 2014.



Figure 6-6 Identified Aboriginal archaeological features within and around the proposal area - north

This information has been redacted to protect sensitive Aboriginal heritage



Figure 6-7 Identified Aboriginal archaeological features within and around the proposal area - south

This information has been redacted to protect sensitive Aboriginal heritage

Construction impacts

Work would largely be occurring in areas with historic evidence of widespread clearing, agricultural use, and ground disturbance. Vegetation removal and ground disturbance in previously undisturbed areas would be avoided where possible.

AHIMS [redacted] is located within the proposal area [redacted]. The site is listed on AHIMS as destroyed and no longer extant. The proposal would therefore not impact potential Aboriginal heritage at [redacted].

AHIMS [redacted] was registered on AHIMS as a PAD. Limited information was available and during the site investigation, the area was found to be visibly disturbed by the construction of the embankment of Heath Road, driveways and above ground utilities. As a result, the area was assessed as exhibiting no archaeological potential. The proposal is therefore unlikely to impact potential Aboriginal heritage at AHIMS [redacted].

AHIMS [redacted] is an isolated artefact. During site investigations, it was found [redacted]. It is located [redacted] AHIMS [redacted] would not be impacted by the proposal as, during

This information has been redacted to protect sensitive Aboriginal heritage

detailed design, the [redacted] design would be refined to avoid potential harm to AHIMS [redacted].

Similarly, AHIMS [redacted] is an isolated artefact. During site investigations, it was found [redacted]. Shallow topsoil in the area was noted to be disturbed from ploughing. The AHIMS site is located [redacted] The location of AHIMS [redacted] would be marked a no-go zone during construction to avoid impact.

This information has been redacted to protect sensitive Aboriginal heritage

If impact to Aboriginal sites cannot be avoided, further detailed Aboriginal heritage assessment would be required. This would include a process of Aboriginal community consultation and preparation of an Aboriginal Cultural Heritage Assessment Report (ACHAR). Should the ACHAR consider the proposal to impact Aboriginal sites, an AHIP may be required. An AHIP issued under section 90 (1) of the *National Parks and Wildlife Act 1974* would be required prior to impacting any Aboriginal archaeological sites located outside of existing AHIP areas.

Operational impacts

During operation, potential impacts to Aboriginal heritage are unlikely to occur. Work during operation would likely occur at the maintenance holes to access the pipes, or at the pump station which would be accessible via a driveway from Gurner Avenue. Maintenance works would generally be minor and are unlikely to involve major ground disturbing work or tree removal.

Therefore, it is unlikely that maintenance during operation would impact Aboriginal heritage sites.

Mitigation measures

With the implementation of the mitigation measures below, potential construction and operation impacts to Aboriginal heritage can be adequately managed. Residual impacts are expected to be minor and temporary.

Table 6-5 Environmental mitigation measures — Aboriginal heritage

Mitigation measures
During detailed design, opportunities for avoiding impacting AHIMS [redacted] and AHIMS [redacted] would be considered including: • removing the [redacted] near AHIMS [redacted] • adjusting the location of the [redacted] farther from AHIMS [redacted].
If the proposal area, scope or potential areas of impact changes, further Aboriginal heritage assessments may be required.
Do not make publicly available or publish, in any form, Aboriginal heritage information on sites, 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.

Mitigation measures

Ensure any works undertaken within the AHIP 5202 area are in accordance with conditions outlined in AHIP 5202. Incorporate the Aboriginal Heritage Management Plan (AHMP) for the Phase 1 project into the CEMP.

If any Aboriginal object or non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify the Sydney Water Project Manager in accordance with SWEMS0009.

All site personnel must be inducted by a heritage specialist (or delegate) before starting work on site. The induction should include clear explanation of heritage constraints, processes and measures to avoid impacts, stop work procedures, and contact details to obtain further heritage guidance if needed. This is to include but is not limited to:

- no-go zones, legal obligations and consequences
- all on-site personnel view as part of site induction the Aboriginal objects video by Heritage NSW: https://youtu.be/kShPePNwADw

If suspected human remains are discovered:

- cease all excavation or disturbance in the area (a buffer for at least 20 m)
- notify the Sydney Water Project Manager in accordance with SWEMS0009
- notify the local Police and NSW Environmental line on 131 555, as soon as practicable
- work is not to recommence in that location unless authorised in writing by Heritage NSW.

6.2.5 Non-Aboriginal heritage

Existing environment

There are several non-Aboriginal heritage listed items within the broader landscape including cottages and landscaping.

The proposal intersects one general local heritage item under the Western Parkland City SEPP, the Bringelly Road Cultural Landscape Area. It represents a historic road alignment and its curtilage generally follows the current alignment of Bringelly Road, located between the Kemps Creek waterway in the west and Camden Valley Way in the east.

The proposal is also adjacent to the Kemps Creek Forest, a landscape local heritage item under the Western Parkland City SEPP. This area corresponds with the Kemps Creek Nature Reserve.

Figure 6-8 provides an overview of the non-Aboriginal heritage items near the proposal area.

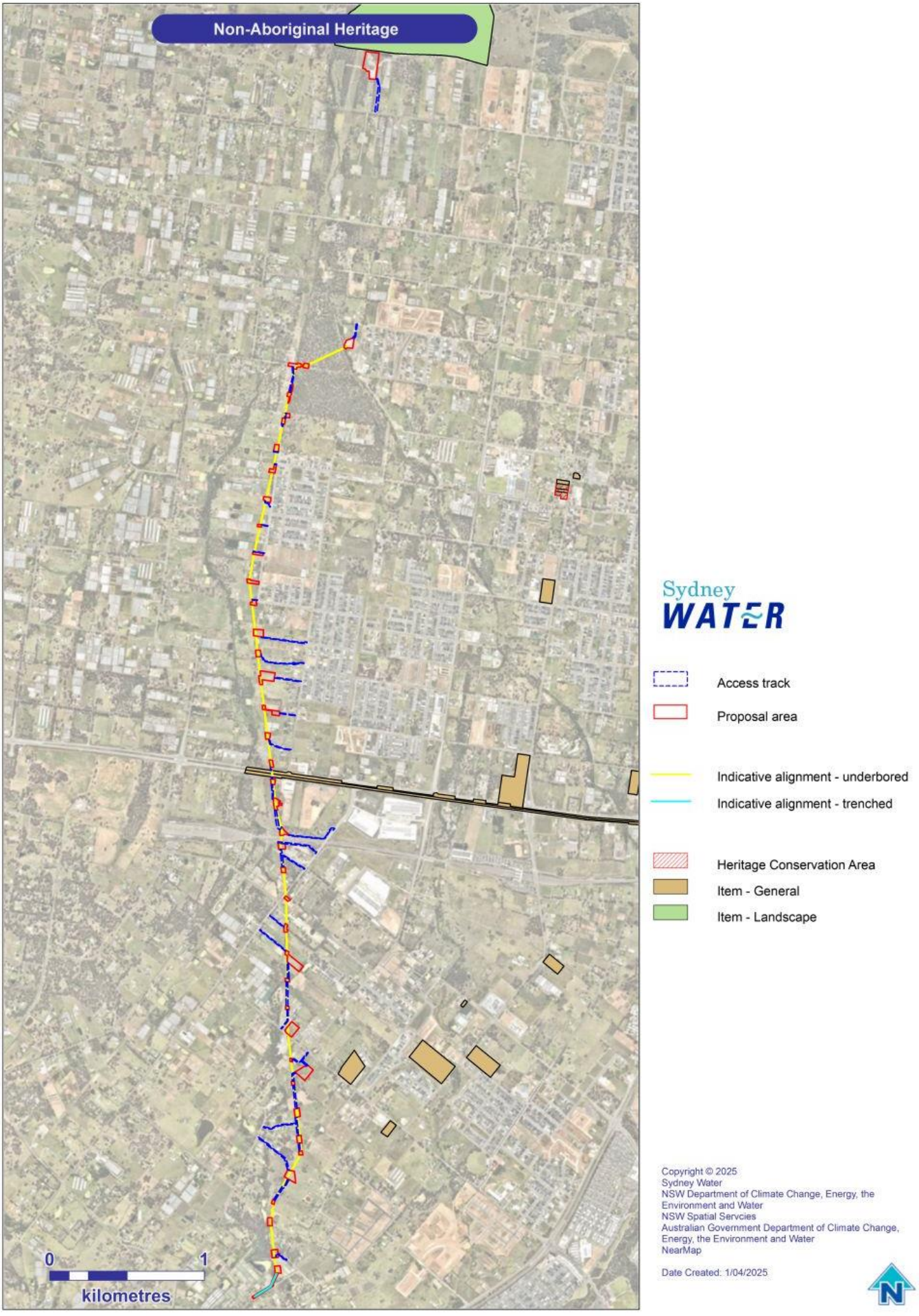


Figure 6-8 Overview of non-Aboriginal Heritage

Construction impacts

During construction, works would largely be occurring in areas with historic evidence of widespread clearing, agricultural use, and ground disturbance. Heritage listed items in the surrounding area are unlikely to be impacted by the proposal due to their distance from the proposal area. Vegetation removal and ground disturbance in previously undisturbed areas have been avoided in the design where possible. This is also minimised through using trenchless methodologies which results in less excavation compared to open trenching. As such, archaeological heritage items are unlikely to be encountered.

Bringelly Road Cultural Landscape Area

The Bringelly Road Cultural Landscape Area is likely to have been heavily disturbed from the Bringelly Road upgrade works. The proposal alignment within the heritage curtilage would be micro-tunnelled at Bringelly Road and would be located entirely below ground. There would be no clearing or excavation within the heritage curtilage. Therefore, the proposal would not impact the heritage values of the Bringelly Road Cultural Landscape Area.

Operational impacts

During operation, potential impacts to heritage are unlikely to occur. Work during operation would likely occur at the maintenance holes to access the pipes, or at the pump station. Works are unlikely to occur within any heritage curtilages as the pipeline would be accessed from the maintenance holes (launch/receival shaft locations) which are located outside of the heritage curtilage.

Therefore, it is unlikely that maintenance during operation would impact the Bringelly Road Cultural Landscape Area heritage curtilage at Bringelly Road and the potential impact to other heritage values would be minor.

Mitigation measures

With the implementation of the mitigation measures below, potential construction and operational impacts to non-Aboriginal heritage can be adequately managed. Residual impacts are expected to be minor and temporary.

Table 6-6 Environmental mitigation measures — non-Aboriginal heritage

Mitigation measures
If any non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify Sydney Water Project Manager in accordance with SWEMS0009.

If suspected human remains are discovered:

- cease all excavation or disturbance in the area (a buffer for at least 20 m)
- notify the Sydney Water Project Manager in accordance with SWEMS0009
- notify the local Police and NSW Environmental line on 131 555, as soon as practicable
- work is not to recommence in that location unless authorised in writing by Heritage NSW.

6.2.6 Noise and vibration

Noise and vibration impacts were identified through desktop assessments and on-site investigations. A specialist assessment report was prepared by GHD to support this REF and is attached as Appendix E – Noise and Vibration (GHD, 2024).

Existing environment

The proposal is in a predominantly rural residential/agricultural setting. Existing noise levels in the study area are primarily influenced by traffic on surrounding local roads, nearby development sites and construction activities. With future planned development and growth throughout the region, the study area would provide land for a range of uses predominantly related to employment, industry, and environmental uses. Sensitive receivers in the vicinity of the proposal include:

- nearby residents
- local home based businesses
- market farms
- schools and childcare centres
- car repair, building supply and transport businesses
- Leppington train station and stabling yard
- Sydney Tongan Seventh-day Adventist Church
- Sydney Dog Training Centre.

Noise monitoring was undertaken in the proposal area to characterise existing background noise levels. Noise monitoring locations are seen in Figure 6-9 and are summarised in Table 6-7 below.

Table 6-7 Background noise levels

Logger	Day	Evening	Night
Logger 1 – [redacted] Austral	35	34	30
Logger 2 – [redacted] Austral	36	36	30
Logger 3 – [redacted] Leppington	37	34	30
Logger 4 – [redacted] Leppington	35	35	31

As the background noise levels at all sites were similar, one consolidated set of background noise levels were adopted for the entire proposal area. These are summarised in Table 6-8Table 6-7 below.

Table 6-8 Adopted background noise levels

Day	Evening	Night
35	34	30

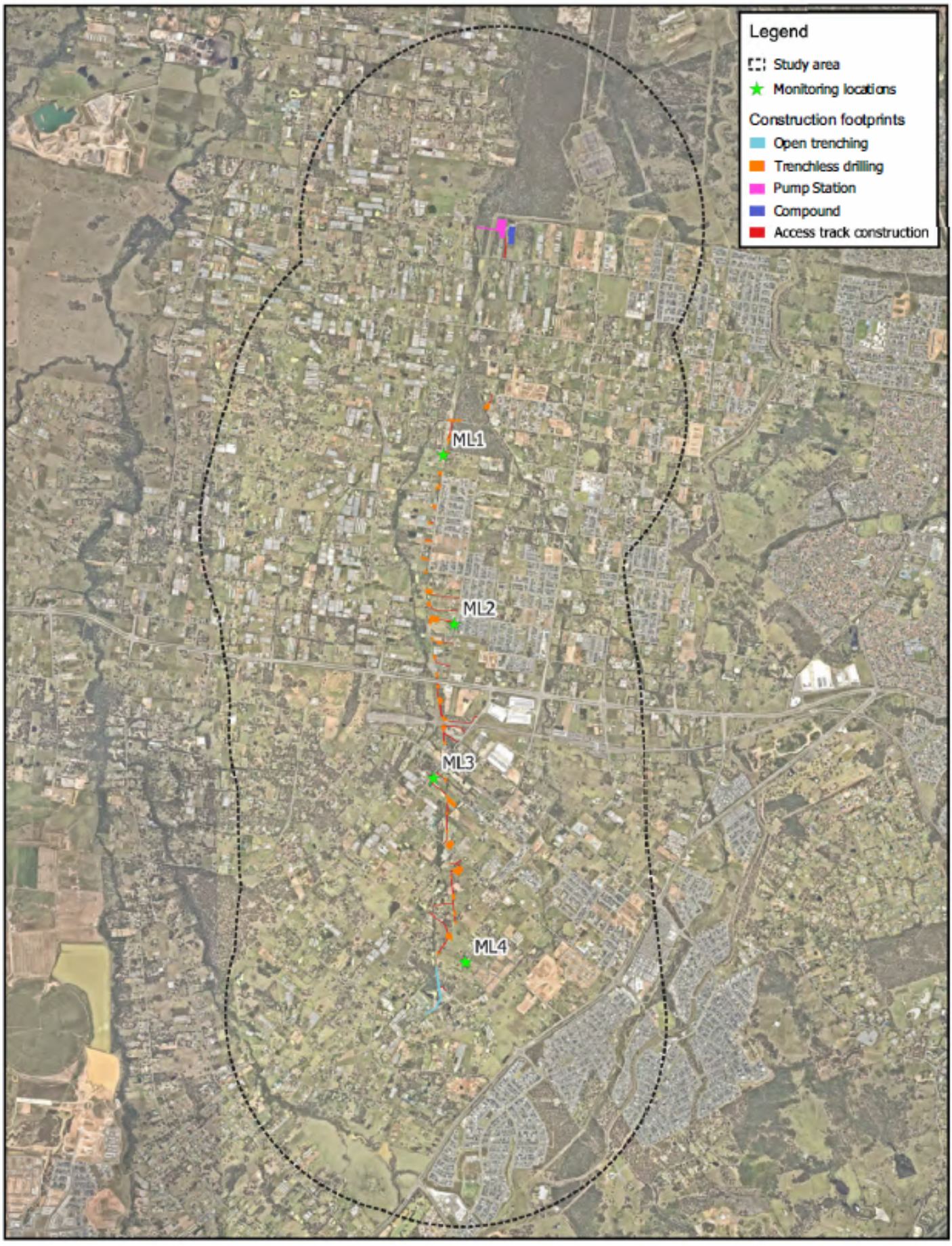


Figure 6-9 Noise monitoring locations

Construction impacts

Noise

During construction, the proposal would generate noise and vibration from:

- vegetation clearing
- excavation
- movement and operation of plant and equipment
- trenching
- drilling
- compound sites.

The majority of work would occur during standard daytime hours. However, at times there may be works and activities that would be outside of standard daytime hours as outlined in section 3.1.

Construction noise impact modelling was conducted for several construction scenarios:

- CS01 – Construction of SP1239: Excavation works
- CS02 – Construction of SP1239: Roads and utilities
- CS03 – Construction of SP1239: Building works
- CS04 – Construction of SP1239: Concrete foundations
- CS05 – Construction of SP1239: Plant and equipment installation
- CS06 – Open trenching: Pipe delivery and installation
- CS07 – Open trenching: Trench excavation and backfill
- CS08 – Open trenching: Construction of ancillary facilities
- CS09 – Trenchless drilling: Micro-tunnel drilling
- CS10 – Trenchless drilling: Excavation for micro-tunnel shaft
- CS11 – Trenchless drilling: Dewatering
- CS12 – Trenchless drilling: Compound operations
- CS13 – Access track construction: Construction of access tracks to compounds (roads and utilities).

The predicted construction noise contours are provided in Appendix E – Noise and VibrationAppendix E – Noise and Vibration Impact Assessment.

Construction noise management levels

Noise compliance criteria were developed in accordance with the Construction Noise and Vibration Guideline (Transport for NSW, 2024). The management levels are summarised in Table 6-9 below.

Table 6-9 Noise management levels

Receiver type	Construction noise management levels dBA				
	Standard recommended hours		Outside recommended hours		
	Noise affected	Highly noise affected	Day	Evening	Night
Residential	45	75	40	39	35
Educational Facilities	55 (external) – when in use[1]				
Active recreation areas	65 (external) – when in use				
Passive recreation areas	60 (external) – when in use				
Places of worship	55 (external) – when in use[1]				
Commercial	70 (external) – when in use				
Industrial	75 (external) – when in use				

[1]Based on a 10 dB attenuation through an open window to achieve an internal level of 45 dBA

SP1239

At SP1239, the highest predicted noise impact would occur during excavation works (CS01). Noise above the noise management level would impact up to 72 sensitive receivers during standard construction hours and 165 receivers during daytime out of hours work periods. During standard and out of hours work periods, 24 receivers closest to the SP1239 site would be the most impacted, experiencing “moderately intrusive” noise levels. No sensitive receivers are predicted to experience “highly intrusive” or “highly noise affected” noise levels and no non-residential receivers would be affected.

SP1239 is expected to start construction in mid 2026 and be completed in 2028. Construction activities would include excavation, establishment of roads and concrete foundations, constructing the pump station building and installing the plant within the pump station. The noise impacts of construction activities at SP1239 would vary throughout the construction period, depending on the specific tasks and equipment used. The higher impacts would occur during use of the rock breaker. Thus rock breaking activities would be limited to standard construction hours where possible.

Open trenching

During open trenching, the highest predicted noise impact would occur during the delivery and installation of the pipeline (CS06). Noise levels above the noise management level would occur at up to 74 sensitive receivers during standard construction hours and 146 receivers during daytime out of hours work periods. One receiver would experience “highly noise affected” noise levels during standard construction hours. During standard and out of hours work periods, 19 receivers would experience “moderately intrusive” noise

levels and three receivers would experience “highly intrusive” noise levels. No non-residential receivers would be affected.

Generally, the noise impacts during open trenching would vary as the works proceed along the linear alignment.

Trenchless construction

During trenchless construction, the highest predicted noise impact would occur during excavation for micro-tunnel shafts (CS10). Noise levels above the noise management level would occur at up to 2,081 sensitive receivers during standard construction hours and 3,422 receivers during daytime out of hours work periods. During standard construction hours, 62 receivers would experience “highly noise affected” noise levels. During standard and out of hours work periods, 554 receivers would experience “moderately intrusive” noise levels and 191 receives would experience “highly intrusive” noise levels.

While micro-tunnelling would extend over several kilometres over the span of several months, the micro-tunnelling would occur at up to 3 launch and receival sites simultaneously and would progress along the alignment. Excavation for micro-tunnel shafts would be the loudest activity due to the use of jackhammers, thus jackhammers would be limited to standard construction hours where possible. Other activities would also contribute to noise levels however their impact is lower and more continuous in nature.

While the overall micro-tunnelling footprint is extensive, individual locations would experience noise impacts for limited periods as the works proceed along the alignment.

Access track construction

Access track construction would affect sensitive receivers across the whole alignment as it occurs at various points across the whole alignment. Noise levels above the noise management level would occur at up to 1,911 sensitive receivers and 3,051 sensitive receivers during daytime out of hours work periods. During standard construction hours, 76 receivers would experience “highly noise affected” noise levels. During standard and out of hours work periods, 431 receivers would experience “moderately intrusive” noise levels and 252 receivers would experience “highly intrusive” noise levels. One commercial receiver would experience a minor (1dB) exceedance of the noise management level.

Access track construction would be required across the proposal area to facilitate the movement of trucks, delivery of equipment and set up of mobile compounds near excavation areas. Only small sections would generate noise at a time as works progress along the alignment. Access track construction would be staged and each track would take around 2 weeks to complete, depending on the length of the track. The short duration and progressive nature of the works would limit the duration of noise impacts for any single receiver.

Vibration

Safe working distances for vibration intensive equipment are outlined in Table 6-10 below showing the vibration screening criteria for buildings and human comfort.

The most vibration intensive activity would involve compaction using a 5-tonne vibratory roller which has the potential to affect several receivers within the 40 m buffer distance for human comfort and 12 m buffer distance for cosmetic damage to structures. The potential vibration impacts are summarised in Table 6-10 below.

Table 6-10 Vibration impacts during each construction phase

Construction phase	Most intensive vibration-intensive equipment	Human comfort		Damage to standard structures	
		Buffer distance (m)	Number of potentially affected receivers	Buffer distance (m)	Number of potentially affected receivers
Construction of SP1239	5-tonne vibratory roller	40	0	12	0
Open trenching	5-tonne vibratory roller	40	1	12	0
Access track construction	5-tonne vibratory roller	40	72	12	18

The equipment associated with trenchless drilling is anticipated to operate with a lower vibration intensity than the 5-tonne vibratory roller. Drilling will also occur more than 10 metres below ground level. Vibration during trenchless drilling is not expected to be significant for receivers.

Operational impacts

During operation, changes to background noise levels are likely to be minimal as the only new noise sources would be the pump station. The assessment found that noise from the wastewater pumping station would comply with the relevant criteria at identified sensitive receivers (refer to Appendix E – Noise and Vibration).

Maintenance works would be carried out according to maintenance schedules or in response to emergencies. Noise may be generated from worker vehicles and handheld equipment, however, these would generally be of short duration and mitigated through consultation with receivers. Noise generated during operation is unlikely to exceed noise management levels an no operational vibrations are expected to occur.

Mitigation measures

With the implementation of the mitigation measures below, potential construction and operational impacts from noise and vibration can be adequately managed. Residual impacts are expected to be minor and temporary.

Table 6-11 Environmental mitigation measures — noise and vibration

Mitigation measures
Works will comply with the Draft Construction Noise Guideline (EPA 2020), including scheduling work and deliveries during standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturday where reasonable. No work to be scheduled on Sunday nights or public holidays. Any proposed work outside of these hours and beyond daytime out of hours work as assessed in this assessment must be justified.

Mitigation measures

The proposal will also be carried out in accordance with Sydney Water's *Noise Management Procedure* SWEMS0056 and the Noise Policy for Industry (EPA 2017).

Justify, document and implement all reasonable and feasible noise mitigation measures on-site to mitigate noise impacts.

Incorporate standard daytime hours noise management mitigation measures into the CEMP, including but not limited to:

- identify and consult with the potentially affected residents prior to the commencement of work:
  - describe the nature of work, the expected noise impacts, approved hours of work, duration, complaints handling and contact details.
  - determine need for, and appropriate timing of respite periods (e.g. times identified by the community that are less sensitive to noise such as mid-morning or mid-afternoon for work near residences).
- ongoing engagement with the community on the construction times
- implement a noise complaint handling procedure
- plant or machinery will not be permitted to warm-up near residential dwellings before the nominated working hours
- select appropriate plant for each task, to minimise the noise impact (e.g. all stationary and mobile plant would be fitted with residential type silencers)
- engine brakes will not be used when entering or leaving the work site(s) or within work areas
- 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 or mounds or site sheds as noise barriers where possible
- schedule noisy activities around times of surrounding high background noise (local road traffic or when other noise sources are active).

For work beyond standard daytime hours as assessed in this assessment, the Delivery Contractor would:

- justify the need for out of hours work and why it is not possible to carry out the work during standard daytime hours
- consider potential noise impacts and implement the relevant standard daytime hours mitigation measures, *Sydney Water's Noise Management Code of Behaviour* (SWEMS0056.01) and document all reasonable and feasible management measures to be implemented
- identify additional community notification requirements and outcomes of targeted community consultation, including any respite periods.

Mitigation measures
• seek approval from the Sydney Water Project Manager in consultation with the Sydney Water Environment and Community Engagement Representatives.
If night works are needed, the Delivery Contractor would: • justify the need for night works • consider potential noise impacts and implement the relevant standard daytime and out of hours mitigation measures and document consideration of all reasonable and feasible management measures • identify community notification requirements (i.e. for scheduled night work (not emergency work)) • Consult the Sydney Water Community Engagement team for any work to be conducted over two or more consecutive nights • notify all potentially impacted residents and sensitive noise receivers not less than one week prior to commencing night work • seek approval from the Sydney Water Project Manager in consultation with the Sydney Water Environment and Community Engagement Representatives • complete a Sydney Water out of hours work request form.
If works on Sundays or public holidays are required, the Delivery Contractor would: • justify why all other times are not feasible • consider potential noise impacts and implement relevant standard daytime, out of hours and nighttime mitigation measures and other reasonable and feasible management measures • identify community notification requirements • seek approval from the Sydney Water Project Manager in consultation with the Sydney Water Environment and Community Engagement Representatives.
Conduct a dilapidation survey / asset condition assessment prior to and after completion of work on structures which have potential to be damaged by vibration.
Consider less vibration intensive methodologies where practicable and use only the necessary sized and powered equipment.
Noisy plant to be positioned and orientated to minimise noise impacts on noise sensitive receivers.
Communicate clearly to “highly noise affected” receivers, explaining the duration and noise levels of the work. Inform receivers of any respite periods.
Limit rock breaking and jack hammering to standard construction hours.
Schedule work bearing in mind the activities and sensitivity of adjacent land uses.

6.2.7 Air and energy

Existing environment

The sensitive receivers in the vicinity of the proposal consist primarily of low density rural-residential properties. The proposal is in a rural-residential area that is planned to be transformed from lower density and less intensive land uses to employment, industry, and residential growth uses. Other sensitive receivers include:

- local home-based businesses
- market farms
- schools and childcare centres
- car repair, building supply and transport businesses
- Leppington train station and stabling yard
- Sydney Tongan Seventh-day Adventist Church
- Sydney Dog Training Centre.

The main existing sources of air pollutants surrounding the proposal area include emissions from motor vehicles, dust from nearby development and local businesses. Sources include:

- construction associated with new developments
- automobile repair businesses
- fertilisers, poultry farms, market gardens.

The existing air quality in the region is expected to be relatively good given the low density of surrounding lands. The National Pollutant Inventory shows the following nearby industries:

- Jemena Gas Austral Main Line Valve, about 2 km east of SP1239
- Inghams Badgerys Creek Protein Recovery Unit, about 1 km west of Bringelly Road
- Jemena Gas Raby Road Main Line Valve, about 2 km south of Riley Road.

Construction impacts

During construction, the proposal has the potential to impact air quality from:

- dust generated by construction vehicles travelling on disturbed or unsealed access routes
- dust from hazardous materials, such as asbestos, due to encountering unexpected hazardous waste during construction
- odour emissions from construction machinery, equipment and vehicles including vehicle exhaust and fuel intensive machinery
- odour from uncovered transported waste
- dust and odour generated during vegetation clearing, excavation, and stockpiling of exposed soils.

These air quality impacts could potentially affect surrounding sensitive receivers. Impacts would largely be dependent on wind direction and strength, and distance of sensitive receivers from the source. The

progressive nature of construction would mean potential dust impacts at a single location would generally be limited and temporary. However, micro-tunnelling and related activities would be longer term. This has potential to result in dust impacts at some receivers over a longer period. An accumulation of dust has the potential to settle on vegetation, waterways and nearby structures. This may reduce a plant's ability to photosynthesise, reduce light within waterways and impact maintenance and operation of nearby structures such as Transgrid assets. With the implementation of the mitigation measures, a material or noticeable effect on air quality from dust emissions would not be likely to occur.

Construction activities would be temporary and would not significantly increase Sydney Water's greenhouse gas (GHG) emissions. GHG emissions would be estimated during detailed design and work methodologies and materials would be refined to reduce the proposal's GHG emissions.

Operational impacts

During operation, changes to background odour at nearby receivers are unlikely and air quality impacts would be limited to emissions from the operation of the pump station. An odour control unit (OCU) would be installed on the west side of the pump station which would minimise potential odour impact from the pump station. Maintenance holes would be equipped with vents up to 18 m high at maximum spacings of 400 m along the alignment. The height and location of the vents are unlikely to cause operational odour impacts to nearby receivers.

Maintenance works would be carried out according to maintenance schedules or in response to emergencies. When maintenance or repair is required, maintenance holes may be opened which may result in odour impacts to nearby receivers. These impacts would be minor and temporary in nature.

Energy use and savings, as well as opportunities to reduce operational GHG emissions would be explored during detailed design.

Mitigation measures

With the implementation of the mitigation measures below, potential construction impacts to air and odour can be adequately managed. Residual impacts are expected to be minor and temporary.

Mitigation measures
During detailed design, carry out the following: • estimate the proposal's carbon footprint and GHG emissions • consider low carbon alternatives and construction materials • consider opportunities to reduce GHG emissions.

Develop a dust management plan as part of the CEMP. In line with Transgrid's conditions of approval, the dust management plan must consider potential damage to transmission line structures. This would include:

- modify or cease work in windy conditions
- cover exposed areas with tarpaulins or geotextile fabric

Mitigation measures
• modify site layout (place stockpiles away from sensitive receivers) • vegetate exposed areas using appropriate seeding • monitor activities with the potential to generate dust • use dust suppression (water spraying or install dust barriers) where appropriate • cover all transported waste.
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.
Use alternative to fossil fuels where practical and cost-effective.
Apply Sydney Water's Best Practice Energy Efficiency Design Guidelines.
Track energy use as per SWEMS0015.28 Contractor NGER template.
Minimise the potential for odours e.g. minimise the number of open access chambers, close maintenance holes overnight. Ensure odour control measures are available and ready to use during construction.
Switch off vehicles/machinery when not in use.

6.2.8 Waste and hazardous materials

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 would seek opportunities to reduce, recycle and reuse materials in accordance with the waste hierarchy (see Figure 6-10). This would be documented in the Waste Management Plan in the CEMP.

Additionally, Sydney Water maintains a Material Stockpile and Material Receiver Dashboard and Register. This provides a centralised location for Sydney Water and its contractors to share real-time information regarding excess or wanted bulk civil material to increase reuse and reduce the disposal of otherwise suitable material for use by projects.

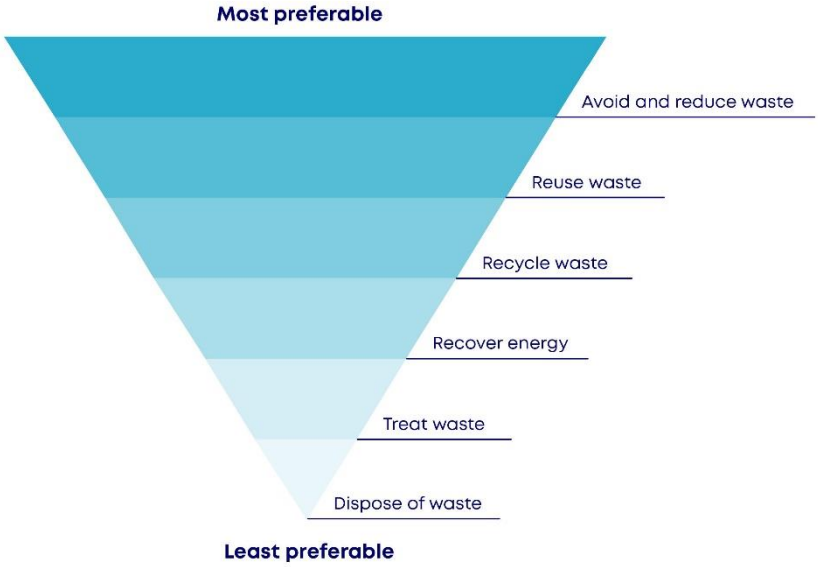


Figure 6-10 Waste hierarchy (Source: NSW EPA)

Existing environment

Historic and current land uses such as farming, construction activities and uncontrolled dumping and filling have likely occurred in the proposal area and surrounding area. During the construction of Phase 1, asbestos containing materials (ACMs) were discovered. Given the historical land uses are similar for this proposal (Phase 2), the potential to encounter contaminated and/or hazardous materials is likely.

Construction impacts

During construction, the largest volume of waste generated by construction would be excess spoil from excavations. About 30,000 m^3 of soil would be excavated for open trenching and excavation of launch and retrieval shafts. Soil would temporarily be stockpiled within the proposal area boundary. Opportunities to reduce, recycle and reuse on this project would be sought with the Delivery Contractor and documented in the Waste Management Plan in the CEMP. Waste streams would be classified in accordance with the Waste Classification Guidelines (NSW EPA, 2014) prior to construction. Wherever possible, suitable excavated spoil would be re-used on site for backfilling, landscaping and other uses. If the spoil is unsuitable for re-use due to its geotechnical or contamination characteristics (including asbestos), spoil would be tested and classified according to the Waste Classification Guidelines (NSW EPA, 2014) and disposed of at an appropriately licensed facility.

Inappropriate management of soil stockpiles has the potential to impact surrounding land and waterways from dust generation, off-site leaching of contaminants, and exposure of contaminated soil, including asbestos (if present). If ACM materials are encountered at the surface or within soils during construction, soils excavated within the area would be classified as ‘Special Waste – Asbestos Waste’. Should the work uncover asbestos or any other hazardous or contaminated material, it would be managed through an unexpected finds procedure.

Section 6.2.3 assesses the impacts of vegetation clearing. It is likely that a portion of this green waste material would be reused or mulched. Some of the waste may classify as weed waste and would be appropriately managed to avoid propagation of weed species around the proposal area and disposed of offsite.

General workforce-generated waste, including food packaging and sewage from portable toilets, would be generated in minor quantities and would be classified as putrescible or non-putrescible general solid waste. Sufficient waste disposal systems would be provided, including clearly labelled bins and regular waste disposal schedules to minimise potential impacts from workforce-generated waste.

Wastewater from equipment washdown or testing and commissioning of the pipes would be released to the environment. Any discharge would follow Sydney Water's Discharge Protocol.

Operational impacts

During operation, the proposal may generate minor volumes of waste during maintenance activities. Maintenance works would be carried out according to maintenance schedules or in response to emergencies. Work during operation would likely occur at the maintenance holes to access the pipes or at the pump station. The works are unlikely to involve tree removal or major ground disturbing work, such as open trenching. Any operational wastes generated during maintenance would be managed and disposed of in accordance with Sydney Water's standard operating procedures and disposed of at an appropriately licensed waste disposal or recycling facility. Therefore, it is unlikely that maintenance and operation of the proposal would cause more than a minor impact from waste and hazardous materials.

Mitigation measures

With the implementation of the mitigation measures below, potential construction and operational impacts to waste and hazardous materials can be adequately managed. Residual impacts are expected to be minor and temporary.

Table 6-13 Environmental mitigation measures — waste and hazardous materials

Mitigation measures
Complete contamination investigations during detailed design. Conduct in-situ waste classifications prior to / during construction. The sampling procedures and density must meet NEPM 2013 guidelines. Any site-specific management measures specified must be adhered to.
The Delivery Contractor will prepare a Waste Managment Plan to appropriately manage and classify any materials including soils, construction/demolition wastes and associated stockpiles. The plan will be approved by the Sydney Water Project Manager in consultation with the Environmental Representative and Contamination and Hazardous Materials 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)

Mitigation measures

- visual monitoring of materials during excavation and measures to be undertaken to prevent co-mingling, and cross-contamination of waste or resource types
- ex-situ waste and resource recovery classification program, including timing relative to the proposal / 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 and facilities
- legislative compliance requirements
- consideration of future maintenance
- site restoration.

The Delivery Contractor will seek opportunities to reduce, recycle and reuse materials. This will be documented in the CEMP.

Minimise the generation of waste and sort waste streams to maximise reuse/recycling in accordance with the legislative requirements. Provide adequate bins for general waste, hazardous waste and recyclable materials.

Minimise stockpile size and ensure delineation between different stockpiled materials.

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.

Prevent pollutants from escaping including covering skip bins and all transported waste.

Dispose excess vegetation (non-weed) that cannot be used for site establishment 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 the Contamination and Hazardous Materials team propertyenvironmental@sydneywater.com.au).

Apply the waste requirements from the Sydney Water USCN: Sustainability guidance document.

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.

6.2.9 Traffic and access

Existing environment

Roads

The majority of the proposal is on private property, with some pipe crossings beneath or running adjacent to several roads. King Street, Devonshire Road and Edmondson Avenue are nearby regional roads, Bringelly Road is classified as a state road, Camden Valley Way is a state and regional road, and all other nearby roads are classified local roads. Table 6-14 provides a summary of the roads that the proposal intersects and key connecting roads and intersections.

Table 6-14 Roads and intersections within the proposal area

Road / intersection	Description	Signposted speed limit (km/h)
Twelfth Avenue	Twelfth Avenue is separated into two by dense bushland (see Figure 3-3). Twelfth Avenue is a sealed local road with one lane in each direction. It provides access to several residential properties, businesses and farms.	50 (not signposted)
Boyd Street	Boyd Street is a sealed local road with one lane in each direction. It provides access to several residential properties, businesses and farms.	50 (not signposted)
Bringelly Road	Bringelly Road is a major state road which was upgraded in 2019 as part of the Transport for NSW Bringelly Road upgrade project. Bringelly Road connects Cowpasture Road and Camden Valley Way in Leppington in the east with The Northern Road and Greendale Road in Bringelly in the west. It has two lanes in each direction which are separated by a vegetated median strip.	80
Eastwood Road	Eastwood Road is a sealed local road. It has one lane in each direction and provides access to several residential properties, businesses and farms. It connects to Bringelly Road.	50 (not signposted)
Eastwood Road / Bringelly Road	The Eastwood Road / Bringelly Road intersection was upgraded as part of the Bringelly Road upgrade project. This has increased traffic capacity and vehicle flow at the intersection by providing dedicated left turn, right turn and through lanes from Bringelly Road. Eastwood Road has dedicated right turn lanes and a shared left turn and through lane.	NA
Heath Road	Heath Road is a sealed local road. It has one lane in each direction and provides access to several residential properties, businesses, farms, churches and ovals.	70
Heath Road / Camden Valley Way	The Heath Road / Camden Valley Way intersection was upgraded as part of the Camden Valley Way upgrade project. It has increased traffic capacity and vehicle flow at the intersection. This has increased traffic capacity and vehicle flow	NA

Road / intersection	Description	Signposted speed limit (km/h)
	at the intersection by providing dedicated left turn, right turn and through lanes in all directions.	
George Road	George Road has one lane in each direction and provides access to several residential properties, businesses, farms and churches. It connects to Philip Road then Eastwood Road in the north and Camden Valley Way in the south.	70
George Road / Camden Valley Way	The George Road / Camden Valley Way intersection is a small intersection with no traffic lights. Travel out of George Road is left turn only onto Camden Valley Way while Camden Valley Way provides dedicated left and right turning lanes into George Road.	NA
Riley Road	Riley Road is a sealed local road with travel in two directions. It is a single lane road which provides access to a few residential properties, businesses and farms.	70
Gurner Avenue	Gurner Avenue is a sealed local road with one lane in each direction and provides access to several residential properties, businesses and schools.	60

Based on publicly available crash data between 2019 to 2023, there were multiple crashes along roads surrounding the proposal including Twelfth Avenue, Boyd Street, Bringelly Road, Eastwood Road, George Road and Camden Valley Way.

The traffic assessment for the Bringelly Road upgrade REF (Transport for NSW, 2011) showed that the average weekday traffic at the approximate location of the proposal's Bringelly Road crossing was 9,130 for all vehicles and 1,000 for heavy vehicles. Since the Bringelly Road upgrade's completion in 2019, it is likely the number of vehicles has increased.

The existing traffic volumes on adjacent local roads are expected to be lower than larger roads such as Bringelly Road and Camden Valley Way. The local roads surrounding the proposal provide localised access to the low density residential area.

Public transport and active transport

Leppington train station services the T2 and T5 train lines as well as several local and special bus services. The first train service to leave Leppington station is at 3:27am and the last train to arrive at Leppington is at 2:38am (Monday to Friday).

There are several bus stops on the local streets surrounding the proposal area. These service the following bus routes:

- 841 Leppington to Narellan, and Narellan to Leppington
- 855 Liverpool to Rutleigh Park, and Rutleigh Park to Liverpool
- 856 Liverpool to Bringelly, and Bringelly to Liverpool

- 857 Narellan to Liverpool
- 858 Leppington to Oran Park Town Centre
- 861 Carnes Hill to Denham Court, and Denham Court to Carnes Hill
- N31 Leppington to Liverpool (night service).

Additionally, some local schools may have school buses which would likely run between 7:30am to 9am, and 2:30pm to 3:30pm. Several of these depart from Leppington train station including:

- 1008 to John Edmundson High School and Holy Spirit Public School
- 1060 to William Carey Christian School
- 1061 to Bellfield College
- 2023 to Good Shepherd Public School.

Bringelly Road has a shared pedestrian and cycle path. All other local streets however have limited formal pedestrian footpaths and cycling lanes.



Figure 6-11 Classified roads

Construction impacts

Roads

During construction, the following vehicle movements are expected and would vary depending on the position of the work along the proposed alignment:

- 20 to 40 trucks per hour to/from compounds
- 2 to 10 trucks per hour to/from other construction sites and locations along the alignment.

Additionally, there would be a construction workforce of up to 400 people at any given time across all construction areas. This would generate an increase in light vehicle movements.

Heavy vehicle movements would be required for transport of material and equipment. The proposal alignment would predominantly be accessed via existing local roads. Construction personnel vehicles would be parked within the proposal area or local roads in available parking spaces where possible. Access to private properties would be maintained at all times. Plant, such as excavators, would be moving within the proposal area. Local councils and Transport for NSW would be consulted, as required by the TISEPP, to obtain any road occupancy licences required.

Construction would be staged to maintain traffic flow as far as reasonably practicable. Traffic, parking and plant movements would 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.

The increase in heavy vehicle traffic during construction could potentially damage road infrastructure, in particular, local roads that are not designed to withstand the weight of heavy vehicles. This would impact local traffic and the local community. The proposed mitigation measures would minimise and manage local road damage.

Given the implementation of mitigation measures, traffic generation is unlikely to have a significant effect on the function, level of service or capacity of the existing road network.

No new access tracks would be required for the pump station. The proposed access for SP1239 would be from Gurner Avenue which is a local public road. Permanent access to the pump station would include a dual lane all-weather sealed access road, with kerb, gutter, surface and subsurface drainage systems (as required) to Gurner Avenue. A vehicle turning area designed to fit a 19 m semi-trailer would be provided at the pump station site. A minimum of three spaces for vehicle parking would be allowed for. Bollards would be placed, where required, to protect the wet well, valve chamber, and above ground structures from vehicles.

Access to private property may be temporarily affected during construction of the pipelines however alternative access would be maintained. Properties would only be affected for a relatively short period of time. Some fence lines may need to be temporarily removed for access. Property owners would be informed of any potential loss of access and appropriate measures would be negotiated to either provide an alternative access or reinstate access at the end of each work day. Any access ways or fences affected by construction would be reinstated to their original condition in consultation with the landowners.

Transgrid’s maintenance and inspection of assets would not be impacted during the proposal’s construction as access would be provided to Transgrid’s personnel throughout construction.

Public transport and active transport

The proposal would be micro-tunnelled under the train line near Eastwood Road. This proposed location is between Leppington station and the train yard and would therefore have minimal impacts on the train services.

There is the potential for minor impacts to public transport services and school bus services. Oversized vehicles and deliveries would be required during the construction phase and would be delivered outside of school start and finish times where possible e.g. during out of hours. Access to bus stops, bus services and the operation of bus routes are unlikely to be impacted by the proposal during construction.

As there are limited formal pedestrian footpaths or cycling lanes in the surrounding road network, potential impacts to pedestrians and cyclists would be minimal.

Operational impacts

During operation, traffic movements may be generated from Sydney Water staff and contractors conducting inspections or maintenance. Maintenance works would be carried out according to maintenance schedules or in response to emergencies. The works are unlikely to involve tree removal or major ground disturbing work and therefore unlikely to general large amounts of traffic. Traffic generation during operation would be significantly lower than traffic generated during construction. Access to Transgrid's assets would not be impacted during operation. Given the low volume of traffic on the surrounding road network, the low volume of traffic generated by operational activities, there would be minimal road, public transport, active transport and access impacts 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 minor and temporary.

Table 6-15 Environmental mitigation measures — traffic and access

Mitigation measures
Prepare a Traffic Management Plan (TMP) as part of the CEMP in consultation with the relevant traffic authority. This will include: • confirmation of haulage routes • access arrangements to the proposal area, including entry and exit locations • management of vehicle movement including measures to encourage rideshare, management of oversized vehicles, materials transport • traffic control and safety measures • consultation and notification requirements • a response plan for any construction-related traffic incident • monitoring, review and amendment plans for traffic management measures • coordination with nearby developments if construction periods and routes overlap

Mitigation measures
• an oversize and/or over mass (OSOM) transport management plan.
Meet Transport for NSW Traffic control at work sites Technical Manual issue 6.1 requirements for Transport for NSW roads. The Delivery Contractor will obtain necessary road licences and permits e.g. a Road Occupancy Licence (ROL) from Transport for NSW, including if works are within 100 m of traffic signals when construction commences. The Delivery Contractor will implement any permit conditions.
Repair any damage on local roads (e.g. potholes) progressively as the construction moves along the proposal alignment.
Erect signs to inform road users of the proposed work, trucks turning and any temporary road closures.
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.
Construction vehicles, plant and machinery are to be parked within the proposal area or on nearby available roads where possible. The Delivery Contractor will ensure private property access would not be restricted.
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).
Manage sites to allow people to move safely past the work, including alternative pedestrian, bicycle, pram and wheelchair access.
Comply with Transport for NSW conditions for underboring the rail line.
Ensure work sites are designed and set up to not impede Transgrid personnel from accessing and conducting maintenance.

6.2.10 Social and visual

Existing environment

The existing visual environment is representative of a rural-residential area interspersed with areas of new development including residential estates, road construction and upgrades.

Land zoning within and adjacent to the proposal area include Infrastructure, Environmental Conservation, Environmental Living, Public Recreation, Transition, Low Density Residential, Primary Production Small Lots and Light Industrial. Some nearby areas are also zoned Medium Density Living however aerial imagery shows that development has yet to occur in those areas.

Residential properties are predominantly single or double storey detached dwellings on large lots. Future changes anticipated for the area include employment, industry, and higher density residential growth. Construction associated with the development of the Western Sydney Airport and SWGA, including land subdivision and construction of single and double storey houses can be seen in the surrounding areas.

Sensitive receivers in the vicinity of the proposal include:

- nearby residents
- local home-based businesses
- market farms
- schools and childcare centres
- car repair, building supply and transport businesses
- Leppington train station and stabling yard
- Sydney Tongan Seventh-day Adventist Church
- Sydney Dog Training Centre.

A number of areas would also have recreational or aesthetic value to the local community including Kemps Creek Nature Reserve and other recreational or conservation areas nearby.

Construction impacts

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 would be visible from residences located adjacent to the proposal. Generally, the proposal areas would be visually shielded from residents by existing vegetation, particularly vegetation along the Kemps Creek waterway. Parts of the proposal area are visually shielded from road users and residents as they are located at the backs of large lots. The alignment of the proposal with the existing high voltage transmission lines also reduces the visual amenity and social impact. As construction would occur progressively, with disturbed areas backfilled and rehabilitated in consultation with landowners, visual and social impacts would be temporary and unlikely to be significant in the long term.

Planned recreational areas near SP1239 may be impacted during high rainfall events due to the raising of SP1239 above flood levels. Consultation with Liverpool City Council would continue during detailed design to minimise the proposal's impacts on the planned recreational areas.

Some impacts to local businesses, such as farms and nurseries, may be experienced through the loss of land during the construction period. Consultation with landowners would continue to occur throughout the project lifecycle to manage and minimise potential disruptions. The proposal is unlikely to significantly impact the businesses in the long term as the proposal area would be restored and equipment removed once construction is progressively completed.

Some out of hours work may occur to minimise disruptions to the local community or subject to permit requirements. Testing, commissioning and connecting the proposal to the pump station and wider network may occur outside of standard hours when water demand is low. This would minimise water supply impacts to the community. No night works are proposed which would avoid causing sleep disturbance to nearby residents.

Following the completion of the work, all plant and equipment associated with construction would be removed and the proposal area would be restored to pre-existing conditions or better. Revegetation of cleared vegetation would occur in situ or in an alternative location in consultation with landowners, Camden

Council and Liverpool City Council. Restoration of work areas would ensure that the potential for long term adverse visual impacts is minimised. Overall, potential impacts on social and visual amenity are considered minor as the work would progress along the alignment and any residual impacts would be temporary and short-term.

Further impacts to social amenity would be associated with noise, air quality, traffic and access (see sections 6.2.6, 6.2.7, and 6.2.9, respectively).

Any residual visual and social impacts would be managed in accordance with the mitigation measures below.

Operational impacts

During operation, most of the proposal would not be prominent in the landscape as structures are predominantly underground. However, above ground structures such as the pump station building and vent shafts would be visible. Considering the future development and growth of the precincts, and the location of the proposal in relation to the existing Transgrid assets, these new above ground structures are not expected to significantly impact the visual character of the environment. The pump station would be landscaped to reduce and minimise any permanent visual impacts.

Maintenance works would be carried out according to maintenance schedules or in response to emergencies. The works are unlikely to involve tree removal, demolition or major ground disturbing work, or require large amounts of machinery and equipment. Work during operation are therefore unlikely to cause social or visual impacts. Maintenance works and upgrades would create positive social impacts by providing a reliable wastewater service.

In the long-term, the proposal would have a positive impact on the community by providing a wastewater network that supports the growth of the precincts and establishment of new jobs in Western Sydney.

Mitigation measures

With the implementation of the mitigation measures below, potential construction and operational social and visual impacts can be adequately managed. Residual impacts are expected to be minor and temporary.

Table 6-16 Environmental mitigation measures — social and visual

Mitigation measures
During detailed design of the pumping station, consider the views from any nearby residences or other locations people may occupy and allow for planting of native vegetation to mitigate visual impacts.
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.
Minimise visual impacts (e.g. retain existing vegetation where possible).

Mitigation measures
Maintain work areas in a clean and tidy condition.
No smoking in bushland areas.
Restore work sites to pre-existing condition or better.

6.2.11 Cumulative and future trends

Existing environment

The potential for cumulative impacts is high due to the changing nature and extensive infrastructure work planned and currently underway in the SWGA. A search of the NSW Department of Planning major projects website identified several projects in the Liverpool and Camden LGAs. Additionally, there are several utility projects and upgrades currently being constructed or planned for the area. Work in the Camden and Liverpool LGAs near the proposal includes:

- Western Sydney Airport and Bradfield City Centre projects
- road construction or upgrades such as the M12, Northern Road and Mamre Road
- North South Rail Line and South West Rail Link Extension
- Sydney Water projects such as Upper South Creek Advanced Water Recycling Centre, Kemps Creek Dual Pressure Mains, South Creek and Badgerys Creek wastewater and drinking water projects
- several new school builds, redevelopments and expansions
- industrial estates, business hubs, warehouse, distribution centres, data centres and resource recovery facilities
- subdivision of lots and development of residential dwellings.

Additionally, much of the land within the precincts have been rezoned to support low density and medium density residential housing.

One of the primary drivers of the proposal is the forecasted population growth in the area. Along with this comes associated noise and traffic impacts. Sydney Water is expanding its network throughout Western Sydney to support growth and the proposal would provide a wastewater network and better wastewater services to future customers.

Future trends

Sydney Water has adopted a position to ensure our service levels can be maintained by managing climate risks. Future trends that could impact the proposal include bushfires, flooding and extreme storm events related to climate change. Construction of the proposal would result in the consumption of fossil fuels for transport, plant and machinery. The proposal's impacts to and from climate change would be further considered during detailed design and reduced as far as practicable.

During detailed design, the proposal's carbon footprint and GHG emissions would be estimated. Additionally, the following would be considered:

- low carbon alternatives and construction materials
- opportunities to reduce GHG emissions
- climate change risks and adaptation opportunities, including the Sydney Water Climate Change adaptation guide.

Construction impacts

Cumulative impacts with other local development occurring in the area may include:

- increased construction noise and vibration relating to multiple plant and equipment operation over the wider area
- increased construction traffic on main arterial roads such as M7, Elizabeth Drive, Bringelly Road, The Northern Road and Camden Valley Way
- increased construction air, odour and dust impacts
- cumulative visual amenity impacts for local receivers
- construction fatigue.

There is the potential for the developments to occur concurrently or following one another. This would lead to potential cumulative impacts in traffic, noise and visual aspects, as well as construction fatigue for local businesses and residents.

The proposal is required to support the future population growth in the south west. Sydney Water recognises the large volume of construction activity that has occurred or is planned to occur within the locality due to the changing nature of the area. There would likely be a progressive increase in background levels of traffic as staged developments within the growth precincts are completed. There would also likely be a progressive increase in noise levels as traffic and construction occurs, and once the Western Sydney International Airport is operational. This prolonged exposure to disruptive activities can lead to fatigue, increased stress and other negative effects. Sydney Water and the Delivery Contractor would consult with the proponents (including other Sydney Water delivery teams) and their contractors to minimise the potential for cumulative impacts where practicable through construction planning.

It would be necessary to continue to monitor and identify any additional activities in the proposal area that may result from broader developments. The proposal would adapt as necessary if this is likely to result in operational or environmental impacts.

Operational impacts

During operation, maintenance works would be carried out according to maintenance schedules or in response to emergencies. This may create minor increases in noise and traffic however, with the rapid development of the broader region, these additions to the greater area are considered negligible.

Future trends may exacerbate risks during operation such as increased water volumes during wet weather events or bushfire impacts to above ground infrastructure. The majority of the proposal is located either below ground, outside the 1% AEP flood extent or raised above the 1% AEP flood level which reduces the

impacts of flooding and extreme wet weather events. The majority of above ground infrastructure (SP1239, maintenance holes and vent shafts) would be a distance from vegetation and would be unlikely to exacerbate bushfire risks.

Mitigation measures

With the implementation of the mitigation measures below, impacts to and/or from cumulative and future trends can be adequately managed during construction and operation, and residual impacts are expected to be minor.

Table 6-17 Environmental mitigation measures — cumulative and future trends

Mitigation measures
During detailed design, carry out the following: • conduct a climate change risk assessment and consider climate change adaptation opportunities, including the Sydney Water Climate Change adaptation guide.
Apply the sustainability requirements from the Sydney Water USCN: Sustainability guidance document.
Continue monitoring and consultation with proponent of developments in proximity to the proposal. Consult with key stakeholders and local developments to coordinate work were practical.
Work to occur during standard daytime construction hours, with some oversized vehicles and deliveries occurring out of hours to reduce potential cumulative noise impacts during construction.
Deliveries and parking to occur within the proposal area to reduce potential cumulative road impacts to the local road network where possible.

6.2.12 General environmental management

Table 6-18 Environmental mitigation measures — general environmental management

Mitigation measures
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 Environment 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 meet the following principles:

- limit proximity to sensitive receivers
- no disruption to property access
- no impact to known items of non-Aboriginal and Aboriginal heritage
- outside high-risk areas for Aboriginal heritage
- use existing cleared areas and existing access tracks
- no impacts to remnant native vegetation or key habitat features
- no disturbance to waterways
- potential environmental impacts can be managed using the mitigation measures in this REF
- no disturbance of contaminated land or acid sulphate soils
- would 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 would require additional environmental impact assessment and may require additional specialist impact assessments (biodiversity, Aboriginal heritage). 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 during:

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

To ensure compliance with legislative requirements for incident notification (e.g. *Protection of the Environment Operations Act 1997*), Sydney Water's employees and contractors would follow SWEMS0009 *Responding to incidents with an environmental impact procedure*.

All site personnel to be inducted into the IMP.

7. Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of the Kemps Creek Carrier Extension. The proposal is required to cater for predicted growth in demand for wastewater servicing associated with the South West Growth Area.

The main potential construction impacts are vegetation clearing, erosion and sedimentation, noise and vibration emissions and increased traffic. During operation, the main potential impacts are associated with visual amenity of vent shafts. It is expected that these impacts would be minimal. The proposal would provide long term benefits by providing a wastewater network to a growing region. 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 result in positive long-term environmental improvements by providing a safe and reliable wastewater network. 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

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Aurecon Arup (2014) Concept Design Report

DPIE (Department of Planning, Industry and Environment) (2020) *Hygiene guidelines for wildlife*

EPA (NSW Environmental Protection Authority) (2014) *Waste classification guidelines*

EPA (NSW Environmental Protection Authority) (2017) *NSW Noise Policy for Industry*

EPA (NSW Environment Protection Authority) (2020) *Draft Construction Noise Guideline*

NPWS (NSW National Parks and Wildlife Service) (2017) *Kemps Creek Nature Reserve*

Sydney Water Upper South Creek Networks: Sustainability Requirements for USCN Program

Transgrid (2024) 2024-310

Transport for NSW (2011) *Bringelly Road upgrade REF*

Appendices

Appendix A – Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	There may be short-term impacts on the community from construction traffic, activities and equipment. Temporary visual, noise, dust and cumulative development impacts to the local community may occur. These impacts would be minimised and managed by mitigation measures in this REF. Localised impacts to biodiversity may also occur. However, this would be temporary as vegetation would be revegetated on site or nearby, where possible, in consultation with landowners. If revegetation on site is not possible, cleared vegetation would be offset offsite in accordance with Sydney Water's Biodiversity Guide. In accordance with this REF, the proposal would not significantly impact sensitive receivers in the community. Once operational, there would be long term environmental improvements through providing a reliable wastewater network.
Any transformation of a locality	The proposal would not result in the transformation of a locality. Work sites would be progressively restored to their pre-construction conditions or better after the completion of works along the alignment. As most of the works are located within an existing Transgrid HV electrical easement, and as the majority of the proposal is located below ground, the proposal is unlikely to permanently transformation the locality.
Any environmental impact on the ecosystems of the locality	The proposal has been designed to minimise ecological impacts where possible. Some vegetation clearing would be required and would be offset in line with Sydney Water's voluntary Biodiversity Offset Guide or the Biodiversity Certification Order. Any potential environmental impacts on ecosystems of the locality would be minimised and managed by the mitigation measures in this REF.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	During construction, there may be temporary aesthetic impacts to nearby receivers due to the presence of machinery and compounds. Once operational, some above ground structures (vent shafts, maintenance holes and the pump station) would be present in the landscape. Most maintenance holes would be located within the existing Transgrid HV electrical easement, with vent shafts located adjacent to the easement. The pump station building would be set back about 300 m from Gurner Avenue providing a large area for landscaping and visual screening. SP1239 is located on land zoned Public Recreation and within a flood zone. Sydney Water would continue consultation with Liverpool City Council to facilitate their plans for public recreation facilities near SP1239. The pump station's construction would have a minimal reduction on recreational values of the locality.
Any effect upon a locality, place or building having aesthetic,	The proposal is unlikely to have a significant effect upon a locality, place or building having aesthetic anthropological,

Section 171 checklist	REF finding
anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations. The proposal has been designed to avoid potential impacts to Aboriginal artefacts. Construction of the proposal would comply with the conditions of AHIP 5202.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposal would have a minor impact to flora and fauna as discussed in section 6.2.3. Impacted vegetation would be offset in accordance with the Biodiversity Certification Order and the Sydney Water Biodiversity Offset Guide as calculated in section 6.2.3. The proposal would not have a significant impact on the habitat of protected animals.
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 would have a minor impact to flora and fauna and impacted vegetation would be offset as calculated in section 6.2.3. Given the mitigation measures are implemented, the proposal would not be endangering any species of animal, plant or other form of life.
Any long-term effects on the environment	The proposal would not have any long-term adverse impacts o n the environment. It will have a long-term benefit by providing a reliable and modern wastewater service for the area.
Any degradation of the quality of the environment	The proposal would not cause the degradation of the quality of the environment. Mitigation measures would be implemented during construction to minimise potential impacts.
Any risk to the safety of the environment	The proposal would not increase risk to the safety of the environment. Climate change hazards have been assessed in section 6.2.11 and concluded the proposal would not exacerbate climate change risks.
Any reduction in the range of beneficial uses of the environment	The proposal would maintain the range of beneficial uses of the environment.
Any pollution of the environment	The proposal would involve earthworks which potentially contribute to temporary impacts on local soils, waterways and air quality. Construction compound sites would be restored to pre-construction or better conditions at the completion of works. Environmental mitigation measures would mitigate the potential for the proposal to pollute the environment. The proposal would connect to the existing network and comply with the Malabar EPL 372. Ultimately, the proposal would comply with the future AWRC EPL.
Any environmental problems associated with the disposal of waste	Waste disposal would be in accordance with the environmental mitigation measures, and no environmental problems associated with the disposal of waste are expected.

Section 171 checklist	REF finding
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposal would not affect demand on resources that are, or are likely to become, in short supply.
Any cumulative environmental effect with other existing or likely future activities	The potential for cumulative impacts to local traffic, noise and visual impacts is high. This is due to the changing nature and extensive infrastructure work planned and currently underway in the SWGA, as assessed in section 6.2.11.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	Due to the distance from the coast, the proposal is unlikely to have any impact on coastal processes or hazards, and coastal processes and hazards are unlikely to have any impact on the proposal.
Any applicable local strategic planning statements, regional strategic plans or district strategic plans made under the EP&A Act, Division 3.1	Section 5.1 describes the strategic context of the proposal. The proposal would support local and regional plans by providing a wastewater service to a growing region.
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.

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 – Western Parkland City) 2021).*	x	

Appendix C – Biodiversity Assessment Report

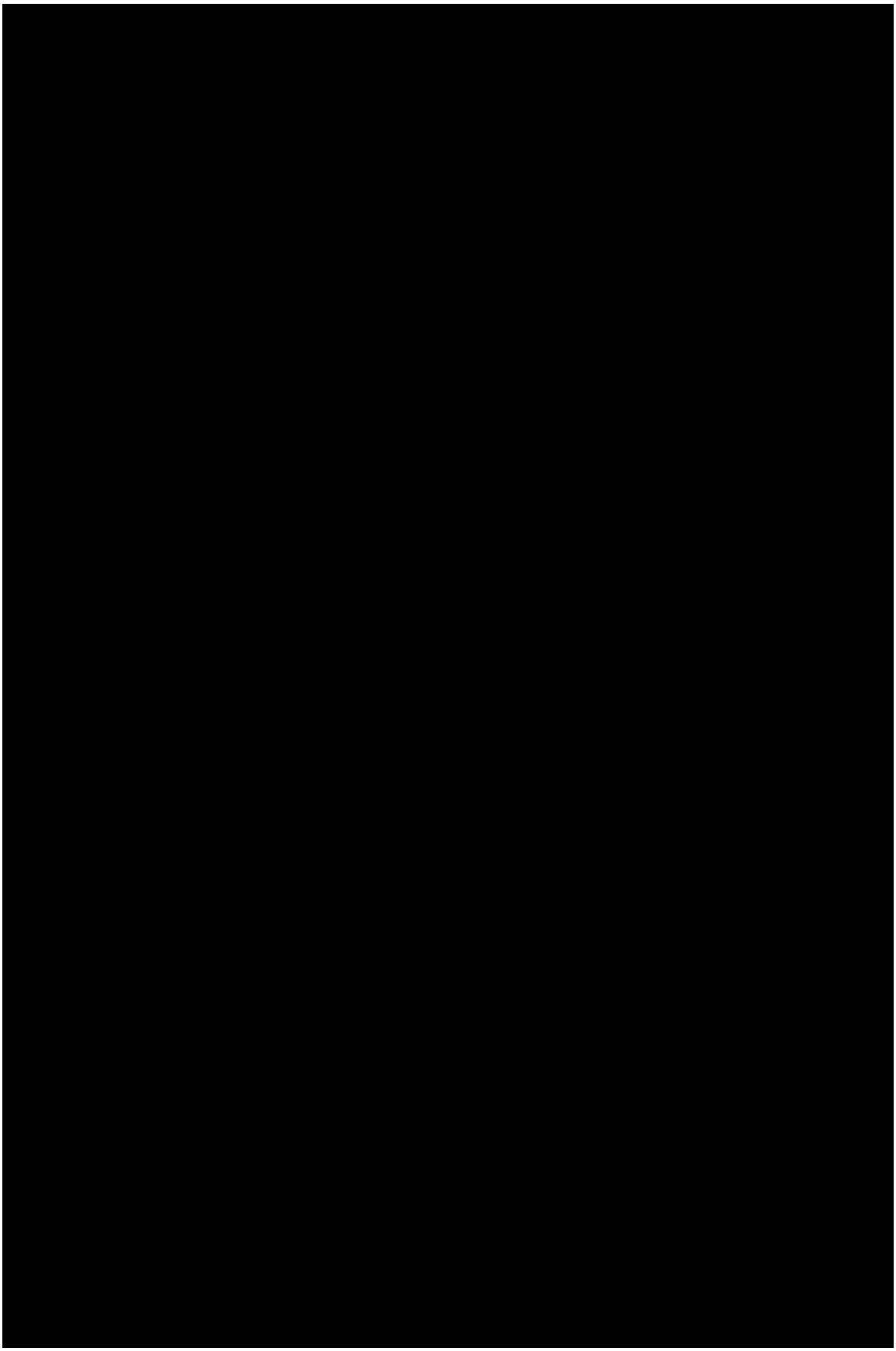
Appendix D – Aboriginal Heritage Due Diligence Assessment

Aboriginal heritage information must not be made publicly available or be published in any form or by any means by Sydney Water or our contractors / joint ventures, unless written approval has been provided to Sydney Water from DPE's AHIMS Registrar.

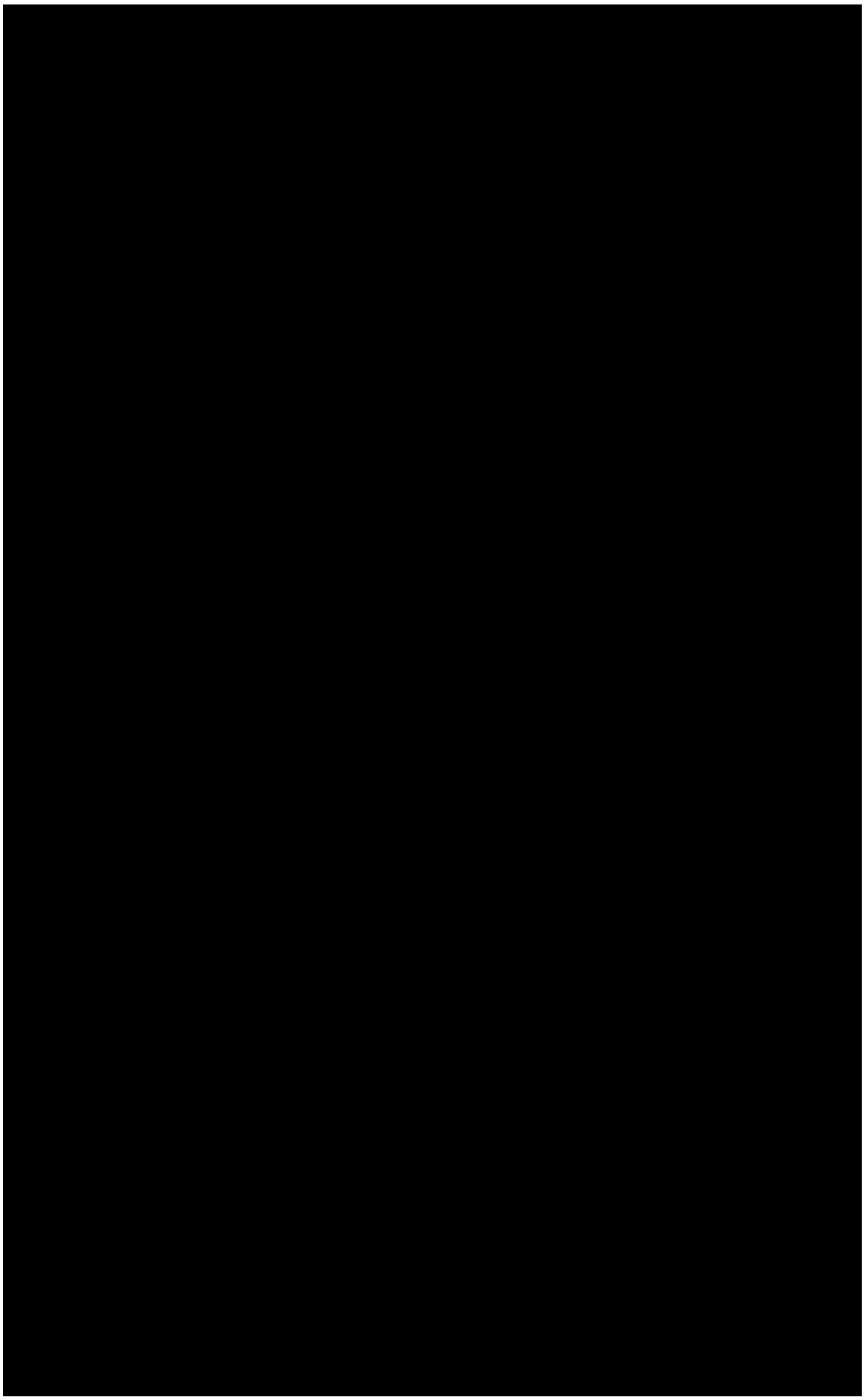
For publicly displayed REFs, all Aboriginal heritage information that identifies individual sites must be removed.

Appendix E – Noise and Vibration Impact Assessment

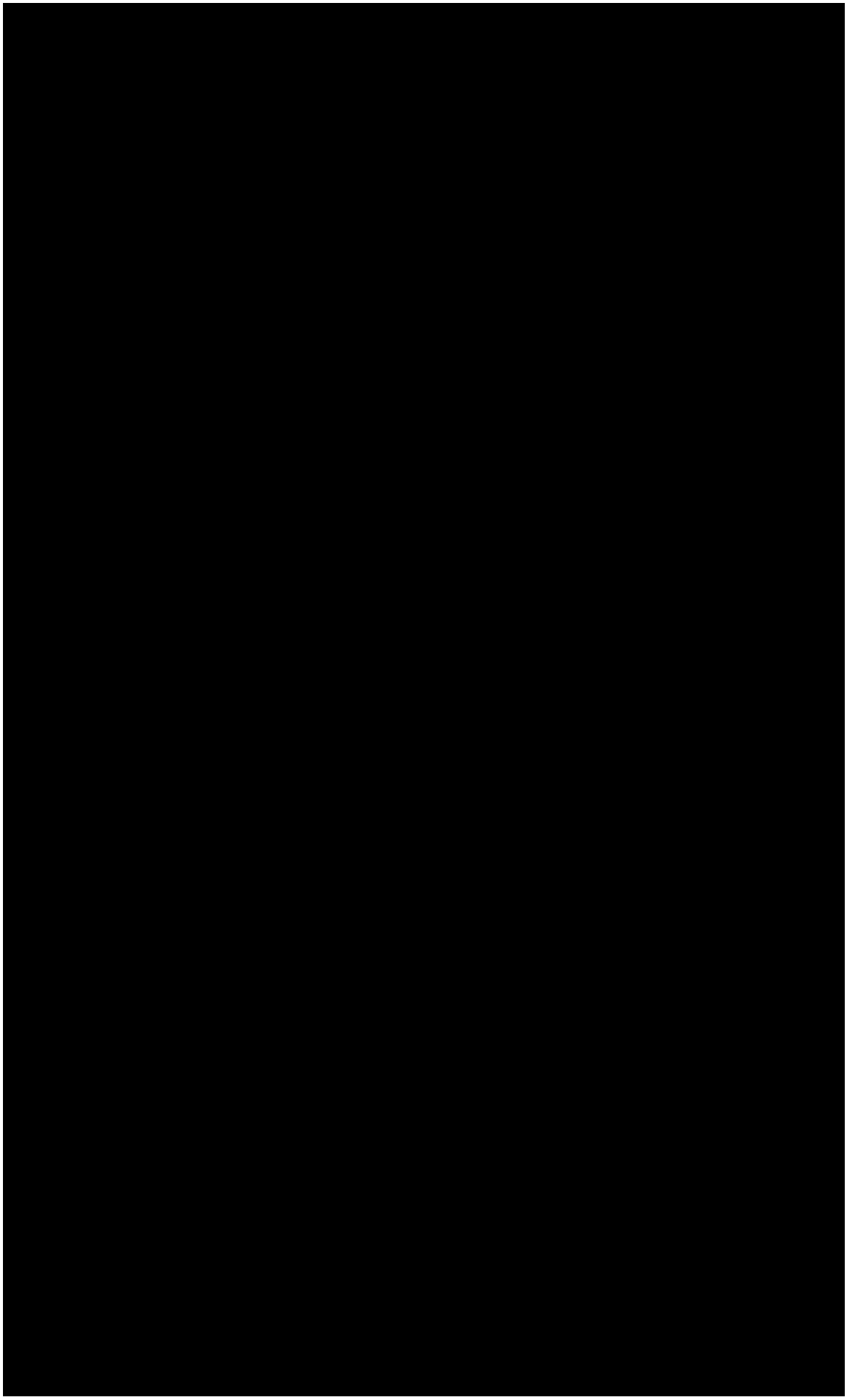
Appendix F – Intersected properties



This information has been redacted to protect sensitive information



This information has been redacted to protect sensitive information





This information has been redacted to protect sensitive information