



Review of Environmental Factors

Thompsons Creek and South Creek Catchments Wastewater Network
Stage 1 (January 2025)

Sydney
WATER

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Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of the Thompsons Creek and South Creek Catchments Wastewater Network project Stage 1. 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.

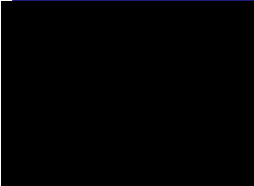
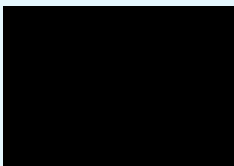
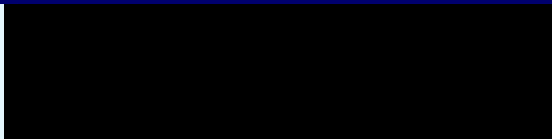
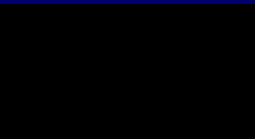
Decision Statement

The main potential construction environmental impacts of the proposal are typical construction impacts such as erosion and sedimentation, vegetation removal, noise and dust, and traffic impacts. The proposal will also impact Aboriginal heritage which will require an Aboriginal Heritage Impact Permit (AHIP) under the *National Parks and Wildlife Act 1974*. During operation the potential impacts will be minor, relating to air quality and visual amenity typical of this type of infrastructure. The proposal will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats. Therefore, a Species Impact Statement (SIS) and/or Biodiversity Development Assessment Report (BDAR) is not required.

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

Certification

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

Prepared by:	Reviewed by:	Endorsed by:	Approved by:
 Ellen Curtis Environmental Scientist Sydney Water Date: 06/01/2025	 Sarah Mitchell Senior Environmental Scientist Sydney Water Date: 07/01/2025	 Will Watts Delivery Manager (Major Project Delivery) Sydney Water Date: 08/01/2025	 Murray Johnson Environment and Heritage Services Senior Manager Sydney Water Date: 09/01/2025



1 Executive summary

Sydney Water plans to build Stage 1 of the Thompsons Creek and South Creek Catchments Wastewater Network (the proposal), to meet growing demand for servicing in the South West Growth Area (SWGA) and Western Sydney Aerotropolis Growth Area (WSAGA).

Construction is expected to start early 2025 and take about two years. Most assets, including pumping stations and pipelines, will be constructed in private property.

The proposal crosses several suburbs and development precincts in the local government areas (LGA) of Liverpool City Council (south of Elizabeth Drive) and Penrith City Council (north of Elizabeth Drive).

The main components of the proposal include:

- two new wastewater pumping stations
- about 9 km of gravity carriers
- about 5.5 km of pressure mains
- overflow pipes and other ancillary infrastructure (e.g., vent shafts, maintenance holes).

As part of this REF, several options and refinements to the design and construction methodology were made to minimise environmental impact. This includes the adoption of trenchless construction methods to avoid sensitive locations and disruptions to traffic. The construction footprint, including the location of construction compounds, was also optimised as far as practicable to reduce environmental impacts.

Much of the work area has been previously disturbed by the construction of roads and utilities or cleared for agricultural purposes. The main construction environmental impacts associated with the proposal include typical construction impacts such as, soil erosion, noise and traffic. Impacts to Aboriginal heritage and vegetation are expected and specialist assessment have been undertaken. Vegetation impacts will include certified and non-certified vegetation under biocertification orders. An Aboriginal Heritage Impact Permit (AHIP), and appropriate notification of vegetation clearing and offset requirements, must be met prior to construction activities commencing. A Construction Environmental Management Plan (CEMP) will be prepared by the contractor to mitigate potential environmental impacts.

During operation, the main impacts are associated with air quality and visual amenity.

The proposal will provide a reliable wastewater network that facilitates further development of the SWGA and Western Sydney Aerotropolis (WSA), 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 Stage 1 of the Thompsons Creek and South Creek Catchments Wastewater Network project and identifies mitigation measures that avoid or minimise potential impacts.

2.2 Proposal background and need

This project has been undertaken in response to the outcomes of the SWGA and WSAGA Sub-Regional Plan (2020). By 2056, an estimated 193,000 new dwellings and 250,000 jobs are forecast in the SWGA and WSAGA.

The proposal is in the suburbs of Badgerys Creek, Bradfield, Rossmore, and Kemps Creek, in the local government areas (LGA) of Liverpool City Council (south of Elizabeth Drive) and Penrith City Council (north of Elizabeth Drive). The proposal crosses several development precincts; Thompsons Creek catchment covers parts of Aerotropolis Core, Badgerys Creek, Wianamatta-South Creek Precincts (rezoned in 2020) and parts of Rossmore Precinct (not rezoned). South Creek catchment covers parts of Badgerys Creek and Wianamatta South Creek precincts (rezoned in 2020) and part of Kemps Creek precinct (not rezoned).

This proposal combines two (Thompsons Creek and South Creek) of five (including Badgerys Creek, Cosgroves and Agribusiness, and Lowes Creek) wastewater infrastructure projects outlined in the Upper South Creek Wastewater Network Options Report (2021) under the Upper South Creek Networks Program (The Program). The Program is designed to service development within the Upper South Creek precinct, which will ultimately be serviced by the proposed Upper South Creek (USC) Advanced Water Recycling Centre (AWRC). The preferred option for the proposal involves a staged delivery of wastewater infrastructure based on growth demands and includes extensive pipelines and several pumping stations. The current assessment is specific to Stage 1, with detail of subsequent stages in Figure 2-1.

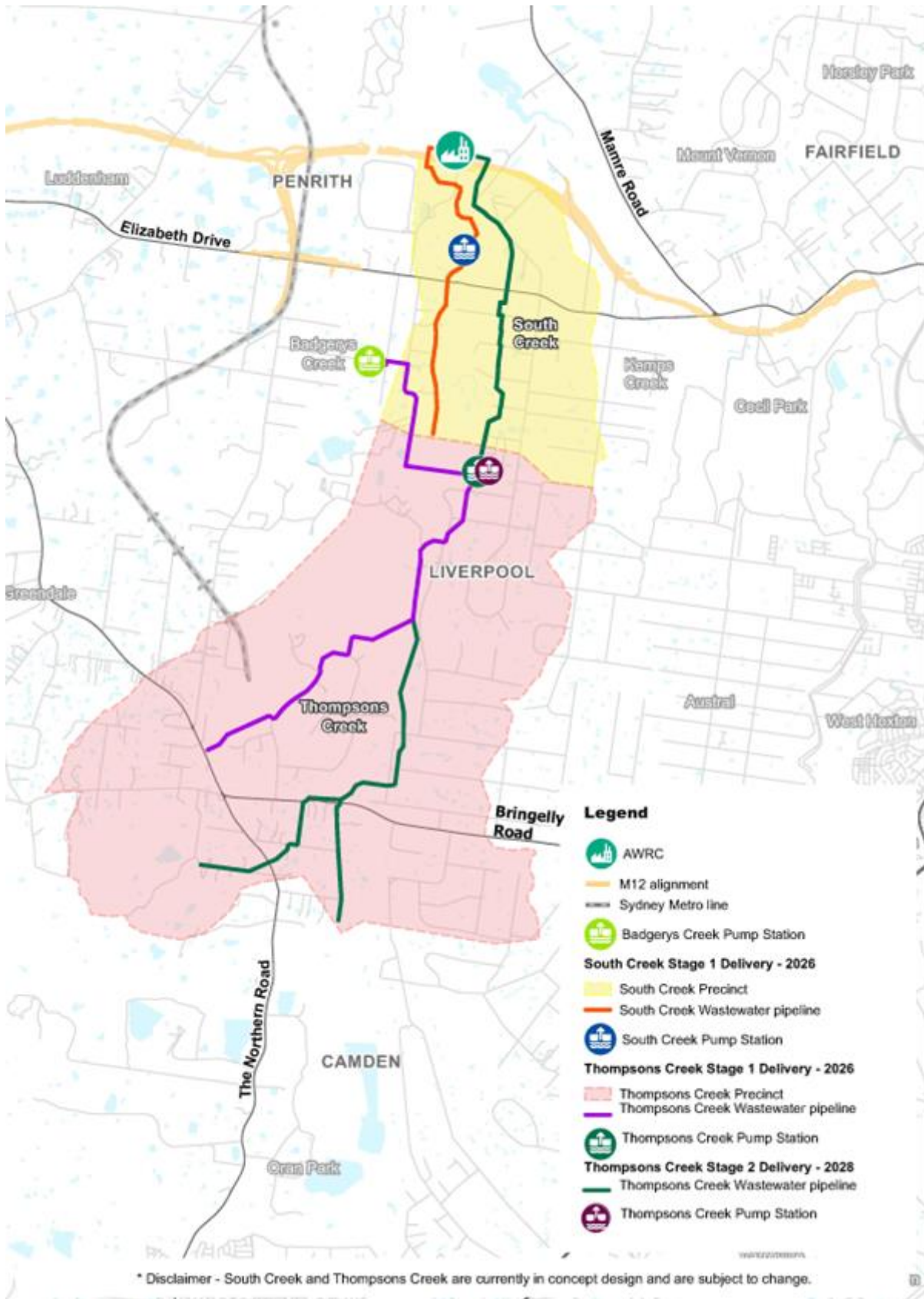


Figure 2-1 Indicative overview of the staging of the proposal and future stages.



The proposal

Stage 1 – Interim servicing 2026 – 2028

Stage 1 will include the delivery of the following assets within the Thompsons Creek (TC) and South Creek (SC) catchments, and are the focus of this REF:

- SP1228 interim pumping station (servicing only the catchments that have been rezoned and are expected to have flows between 2026 and 2028). This is the site for the Stage 2 future ultimate facility, SP1241.
- TCGC01 gravity carrier to SP1228
- TCGC02 gravity carrier to TCGC01 gravity carrier
- TCPM01 from SP1228 (connecting to Badgerys Creek gravity carrier BCGC01, which is not within the scope of this project)
- SP1243 pumping station
- SCGC01 gravity carrier to SP1243 pumping station
- SCPM01 from SP1243 to USC AWRC.

Future stages

Stage 2 – Ultimate servicing 2028.

Stage 2 involves the ultimate servicing of both the Thompsons and South Creek catchments. Lowes Creek catchment (SP1244) will transfer flows to Thompsons Creek catchment which will use SP1241 (ultimate) to transfer flows to the USC AWRC. Delivery by 2028 is required to service growth and to transfer Lowes Creek catchment from the West Camden system, which will exceed capacity for both treatment and network at this time. At this time there is no wastewater infrastructure proposed for South Creek Stage 2. However, there will be reticulation connections from the eastern side of South Creek to SCGC01 on the western side, noting that development on the eastern side is currently not expected until 2046. Inlets will be allowed in SCGC01 for these future connections.

Stage 2 will include the delivery of the following assets:

- TCGC03 gravity carrier from Lowes Creek TCGC02/TCGC01 (to transfer flows from catchment and flows from SP1209 to SP1241)
- TCGC05 gravity carrier (connecting into TCGC03)
- SP1241 (ultimate) pumping station
- TCPM02 and TCPM03 pressure mains from SP1241 to USC AWRC.

Stage 3 – 2030

Stage 3 will include the extension of a gravity carrier main to service future rezoning for Dwyer Road.

Table 2-1 summarises the proposal need, objectives and consideration of alternatives.

Table 2-1 Proposal need, objectives and consideration of alternatives

Aspect	Relevance to proposal
Proposal need	<p>This proposal is needed to provide wastewater servicing to new growth and development areas, within the LGA of Liverpool City Council (south of Elizabeth Drive) and Penrith City Council (north of Elizabeth Drive). The proposal crosses several development precincts; Thompsons Creek catchment covers parts of Aerotropolis Core, Badgerys Creek, Wianamatta-South Creek Precincts (rezoned in 2020) and parts of Rossmore Precinct (not rezoned). South Creek catchment covers parts of Badgerys Creek and Wianamatta South Creek precincts (rezoned in 2020) and part of Kemps Creek precinct (not rezoned). Sydney Water is responsible for providing wastewater infrastructure in these development precincts and has been progressively delivering services as development occurs.</p> <p>The new wastewater infrastructure is dependent on the completion of adjacent catchment projects in planning or construction, to service the SWGA. All flows from the current proposal will ultimately connect to the USC AWRC and will be operated under the future USC catchment and AWRC Environmental Protection Licence (EPL).</p> <p>The key driver for the proposal is to ensure there is sufficient wastewater system capacity to service the governments planned development within the SWGA. This proposal is required to meet Sydney Water's commitment to service continuing growth in the SWGA as stated in the Growth Servicing Plan (2019-2024).</p>
Proposal objectives	<p>The proposal objective is to:</p> <ul style="list-style-type: none"> • provide timely delivery of wastewater infrastructure to support development and growth in the SWGA and WSAGA • meet Sydney Waters statutory and regulatory obligations. <p>The secondary objectives are to provide services that:</p> <ul style="list-style-type: none"> • protect public health • protect catchment and river health • provide affordable and efficient wastewater services • provide resource and energy efficient wastewater services.
Consideration of alternatives/options	<p>An options assessment process informed the design of the proposal. The process identified several alignment options, with preferred options outlined in the project concept design report. Sydney Water assessed these options to determine their feasibility and ultimately selected the most appropriate option. Options were assessed against their ability to deliver the proposal objectives, technical feasibility (i.e. whether it could feasibly be built and operated), potential environmental impacts and performance, social and community outcomes, and cost. The presented proposal was selected as the preferred option during concept design as it would achieve the proposal</p>

Aspect	Relevance to proposal
	<p>objectives with an acceptable level of risk at the least cost and within the preferred timeframe.</p> <p>During the proposal's concept design phase, an alternative option within the Elizabeth Enterprise Precinct (EPP) was considered in consultation with, and at the request of, the developer, Mirvac (Mircac alternative option). The alternative alignment, if selected during detailed design, would be connected to SCPM01. The environmental values of the Mircac alternative option are included to inform detailed design. Impacts arising from the possible construction of this option were assessed as having a comparable impact to Sydney Water's proposed SCPM01 (see Section 6 for discussion) but would incur increased project costs.</p> <p>Further refinement is being made during detailed design. At the time of writing, Sydney Water continues to consider catchment-wide optimisation options.</p>



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
<p>Precautionary principle - <i>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.</i></p>	<p>The proposal will not result in serious or irreversible environmental damage and mitigation measures have been designed to reduce scientific uncertainty relating to the proposal. The proposal has been designed to minimise impact to the environment by employing alternative construction methodologies (such as trenchless installation), minimising vegetation removal, and positioning infrastructure in previously disturbed areas (e.g. road corridors) where possible.</p> <p>Additionally, the REF has been prepared based on the results of specialist assessments, including fieldwork. The proposal has been developed to avoid environmental impacts where possible, and mitigation measures will be implemented to minimise impacts. This proposal is therefore considered to be consistent with the precautionary principle.</p>

Principle	Proposal alignment
	<p>Once operational, the proposal would connect new properties into the wastewater network. The proposal would support compliance with the future USC catchment and AWRC EPL, which would reduce the risk of any serious or irreversible environmental damage from the new assets.</p>
<p>Inter-generational equity - <i>the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.</i></p>	<p>The proposal would not result in any impacts that are likely to significantly impact on the health, diversity or productivity of the environment for future generations. The proposal involves activities that have the potential for environmental and social disturbance, however these would be managed by implementing the mitigation measures provided in this REF. The proposal would benefit future generations as it would provide wastewater infrastructure to service future residents and businesses within the precincts. The development of the area requires water and wastewater servicing. This proposal provides the infrastructure necessary to support the development of the area in a way that protects the environment, by managing predicted wastewater volumes. The proposal has also been developed to avoid or minimise environmental impacts where possible, such as avoiding direct impacts to Key Fish habitat (KFH) and threatened ecological communities (TECs) wherever possible.</p>
<p>Conservation of biological diversity and ecological integrity - <i>conservation of the biological diversity and ecological integrity should be a fundamental consideration in environmental planning and decision-making processes.</i></p>	<p>The proposal will not significantly impact on biological diversity or impact ecological integrity. Planning and design elements have been developed to conserve ecological integrity. Where viable, high direction drilling (HDD) and/or micro tunnelling has been proposed, for example underneath South Creek and in areas adjacent to mapped KFH, existing native vegetation, and high value Aboriginal heritage to limit surface disturbance.</p> <p>The construction corridor has been designed to avoid and minimise impacts to sensitive ecological features as much as possible. This includes having no-go zones to reduce impacts to vegetation and avoiding direct impacts to high value areas through</p>

Principle	Proposal alignment
	<p>minor alignment adjustments, where possible. Additionally, implementing Sydney Waters non-statutory biodiversity offsets will also support future improvement of the biological diversity and ecological integrity of the area.</p>
<p>Improved valuation, pricing and incentive mechanisms - <i>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</i></p>	<p>The proposal will provide cost efficient use of resources and provide optimum outcomes for the community and environment. This has been achieved through actions including:</p> <ul style="list-style-type: none"> • sizing the mains based on growth predictions to reduce the risk of needing future duplication or upgrade • identifying cost-efficient use of resources during construction, e.g. re-use of waste material • identifying non-intrusive construction methodologies such as trenchless construction in specific areas to minimise environmental impacts to waterways and other sensitive areas • providing suitable wastewater infrastructure for future population demands.

3 Proposal description

3.1 Proposal details

Table 3-1 describes the proposal and Figure 3-1 to Figure 3-10 show the location and environmental constraints.

Table 3-1 Description of proposal

Aspect	Detailed description																
Proposal description	<p>The proposal includes the construction and operation of wastewater mains, including gravity carriers (GC) and pressure mains (PM), and two new pumping stations along Thompsons Creek (TC) and South Creek (SC). TCSC Stage 1 infrastructure is summarised below:</p> <table> <tr> <th>Asset</th><th>Description</th></tr> <tr> <td colspan="2">Thompson Creek Stage 1</td></tr> <tr> <td>TCGC01</td><td>2.45 km gravity carrier, ranging in diameter from 1290 mm to 1348 mm. Trenchless construction.</td></tr> <tr> <td>TCGC02</td><td>3.8 km gravity carrier, ranging in diameter from 618 mm to 760 mm. Trenchless construction.</td></tr> <tr> <td>TCPM01</td><td>3.25 km pressure main, ranging in diameter from 280 mm to 300 mm. Open trenching construction, with trenchless creek crossings.</td></tr> <tr> <td colspan="2">South Creek Stage 1</td></tr> <tr> <td>SCGC01</td><td>2.8 km gravity carrier, ranging in diameter from 225 mm to 450 mm. About 2.55 km is proposed to be trenchless construction, including Elizabeth Drive roadway crossing.</td></tr> <tr> <td>SCPM01</td><td> <p>2.2 km 400 mm diameter pressure main. Runs from SP1243 to the future AWRC. Proposed open trenching construction, with trenchless dual pipeline installation to cross South Creek where the alignment is within the Fleurs Radio Telescope site.</p> <p>The Mirvac alternative option would supersede a portion of this alignment, if selected as a preferred alignment option during detailed design. Proposed construction method as per SCPM01.</p> </td></tr> </table>	Asset	Description	Thompson Creek Stage 1		TCGC01	2.45 km gravity carrier, ranging in diameter from 1290 mm to 1348 mm. Trenchless construction.	TCGC02	3.8 km gravity carrier, ranging in diameter from 618 mm to 760 mm. Trenchless construction.	TCPM01	3.25 km pressure main, ranging in diameter from 280 mm to 300 mm. Open trenching construction, with trenchless creek crossings.	South Creek Stage 1		SCGC01	2.8 km gravity carrier, ranging in diameter from 225 mm to 450 mm. About 2.55 km is proposed to be trenchless construction, including Elizabeth Drive roadway crossing.	SCPM01	<p>2.2 km 400 mm diameter pressure main. Runs from SP1243 to the future AWRC. Proposed open trenching construction, with trenchless dual pipeline installation to cross South Creek where the alignment is within the Fleurs Radio Telescope site.</p> <p>The Mirvac alternative option would supersede a portion of this alignment, if selected as a preferred alignment option during detailed design. Proposed construction method as per SCPM01.</p>
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Aspect	Detailed description
	<p>SP1243 and overflow Planned ultimate pumping station, located at 1669–1723 Elizabeth Drive, Badgerys Creek.</p> <p>SP1228 (interim) (site of Stage 2 future ultimate facility, SP1241) and overflow Planned interim pumping station, located at 295 Western Road in the suburb of Kemps Creek.</p> <p>These major components are shown in Figure 3-1.</p> <p>There will be vent shafts, maintenance holes, scour pits and air valves at various locations along the alignment. The network is designed to connect into the USC AWRC, the latter is expected to be operational and ready to receive flows by the completion of TCSC Stage 1.</p>
Location and land ownership	<p>The proposal is located within the SWGA, about 40 km south west of the Sydney CBD in the suburbs of Badgerys Creek, Bradfield, Rossmore, and Kemps Creek, in the LGA of Liverpool City Council and Penrith City Council. The proposal intersects private property, developer owned land, and council land.</p> <p>SP1228 (interim) will be located within [REDACTED] within [REDACTED]. This land is currently privately owned. A portion of this lot will need to be acquired and an access easement established.</p> <p>SP1243 will be located within [REDACTED], within Mirvac's Elizabeth Enterprise Precinct (EEP) and has been selected in consultation with Mirvac. A portion of this lot will need to be acquired and an access easement established.</p>
Site establishment and access tracks	<p>Site establishment includes delineating the construction sites, storage and laydown areas, erosion and sediment controls, traffic management and vegetation removal. Site establishment may also include surveys, service location, geotechnical investigations or other investigations required prior to construction. It may also include service relocation where services are identified that may be affected. Access to the alignment and construction sites will generally be via existing roads and along the proposed construction footprint (see Figure 3-1).</p> <p>Temporary access tracks may be established where necessary. The location of these will be chosen by the contractor, in consultation with the landowner(s) and approved by Sydney Water's Project Manager as described in the mitigation measures in Section 6.2.8. Temporary access tracks will be removed at the completion of construction.</p> <p>New permanent access roads to SP1228 and SP1243 will be required.</p>



Aspect	Detailed description
Ancillary facilities (compounds)	Construction compound(s) will likely be required to house site sheds, construction amenities and materials laydown. During the design phase, the location of compounds and access tracks could not be confirmed. The exact location of these will be chosen by the contractor, in consultation with the landowner(s) and approved by Sydney Water's Project Manager as described in the mitigation measures in Section 6.2.8.
Methodology	<p>The construction phase of the proposal will include pressure mains, gravity mains, pumping stations including overflow pipes, associated fittings, and vent shafts. The scope of work is shown in Figure 3-1 to Figure 3-10.</p> <p>Investigation/site establishment</p> <p>The following activities may be required:</p> <ul style="list-style-type: none"> • investigative works including geotechnical, contamination and survey works • soil sampling and waste classification • site preparation works including: <ul style="list-style-type: none"> - establishing temporary compounds - installing erosion and sediment controls - traffic management measures as required for access to pumping stations and along the alignment corridor - vegetation trimming/removal. <p>Pipelines</p> <p>The wastewater pipelines would be installed underground using a combination of open excavation (trenching) and trenchless construction methods (e.g. HDD, HAB and microtunnelling). Open trenching will be used in areas that are accessible and have minimal environmental constraints. Trenchless methods will be used for difficult to access locations or environmentally sensitive areas.</p> <p>Open trench construction</p> <p>Open trenching construction will generally occur progressively where a section will be trenched, a section of pipe will be installed, and that section will then be backfilled and restored to pre-existing conditions. Trenches will range from about 1 m to about 6 m deep and will be about 1.2 m to 2 m wide. It is expected that where dual pipelines are proposed, they will be installed in the one wider trench.</p> <p>Construction by open trenching will involve:</p> <ul style="list-style-type: none"> • stringing pipe sections along the construction corridor • excavating trenches, stockpiling spoil material beside the trench

Aspect	Detailed description
	<ul style="list-style-type: none"> • benching or shoring up trenches, depending upon trench depths • spreading granular bedding material such as sand or gravel in the trench • installing a section of pipe in the trench • pressure/vacuum testing pipeline • backfilling trench with compacted bedding material and spoil • restoring disturbed areas and replacing topsoil • reinstating any areas where the road surface has been disturbed in accordance with the requirements of local council. <p>Trenchless construction</p> <p>Trenchless techniques such as microtunnelling, HDD and HAB will be used to mitigate environmental impacts and avoid sensitive areas including KFH, waterways, heritage and biodiversity where specified, and some road crossings.</p> <p>Microtunnelling and HAB will be used for gravity sections and will involve the excavation of deep pits at either end of each trenchless Section that serve as launch and receival points for the pipeline. Pits will be about 4 m wide and 6 m long.</p> <p>HDD will be used for construction of the rising mains and will generally involve drilling from the surface. Excavation dimensions of HDD pits may be required and will be between about 4 m x 4 m (single pipe) to 4 m x 10 m (dual pipe).</p> <p>Pipes installed using HDD would be up to about 20 m deep. Pipes installed via other methods will be at depths ranging from about 6 m to about 22 m.</p> <p>An area about 40 m wide by 60 m in length will be required around each proposed pit and/or maintenance hole location, to be used as a site compound and/ or laydown area for equipment, plant, and spoil storage. These locations are indicative and may be adjusted within the assessed construction corridor to avoid areas of high environmental value, including vegetation and heritage features as long as they:</p> <ul style="list-style-type: none"> • remain within the assessed construction corridor of the REF and have no net additional environmental impact • are chosen by the contractor in consultation with the landowner(s) and approved by Sydney Water's Project Manager as described in the mitigation measures in Section 6.2.11. <p>For drilling, a potable water source will be fed to the drill rig, which in turn will be fed to the drill head for lubrication. The drilling fluid will make its way back to the launch site of the drill rig progressively. The bore slurry would be pumped into a recycling unit where it would be agitated to remove clay cuttings and separate</p>

Aspect	Detailed description
	<p>solids for off-site disposal to appropriately licensed EPA facility. Following the clay removal, the recycled fluid would be re-used and sent back to the bore head for lubrication. This cycle would continue for the duration of the drilling operation.</p> <p>Construction by HDD will involve:</p> <ul style="list-style-type: none"> • stringing pipe at the receival pit • positioning directional drilling plant at the launch pit • drilling pilot hole from the surface at the launch pit to the receival pit • back reaming of pilot hole from receival pit to launch pit • pulling pipe back from the receival pit to the launch pit • grouting around the pipe • restoration around launch and receival pits. <p>Construction by microtunnelling and HAB will involve:</p> <ul style="list-style-type: none"> • excavating launch and receival pits to the depth of the pipeline at either end of a section (within the construction footprint) • shoring up pits using sheeting and bracing structures • lowering the drilling plant into the launch pit • lowering sections of pipe into the launch pit • site restoration, including reinstating road pavement, road verge and vegetation where required • using the plant to push the cutting head, followed by the sections of pipe, to the receival pit and grouting around pipe. <p>There will be vent shafts, maintenance holes, scour pits and air valves at various locations along the alignment. The direct construction impact area is anticipated to be up to 5 m x 5 m for ancillary structures and will typically be within the construction footprint of pits; all being located within the 40 m construction corridor. Vent shafts will be about DN300 and will allow ventilation of odours from the mains into the atmosphere at an indicative height of 18 metres and maximum spacing of 400 m, subject to confirmation during detailed design.</p> <p>Pumping station construction</p> <p>Two pumping stations are proposed. Maximum excavation for construction is anticipated to be up to about 23 m below ground surface level. Construction of pumping stations will include emergency storage, odour control unit (OCU) and chemical dosing unit. Above ground electrical kiosk and switch room building are also proposed.</p> <p>SP1243 will consist of an in ground wet well (~ 25 m deep, 5.6 m diameter), inlet maintenance hole (~ 21.5m deep, 3.5 m diameter), valve chamber (~ 2.9 m</p>

Aspect	Detailed description
	<p>deep, 5.5 m long, 4.9 m wide), and surge tank slab and platform (~ 4.4 m x 4.8 m slab, ~ 4.9 m high platform). The design flow of SP1243 is 141 L/s.</p> <p>SP1228 (interim pumping station) will consist of an in ground wet well (~17.5 m deep, 5.8 m diameter), valve chamber (~ 2.9 m deep, 5.5 m long, 4.7 m wide), inlet maintenance hole (~ 16.4 m deep, 3 m diameter), and intermediate maintenance hole (~16.7 m deep, 6.3 m diameter). The design flow of SP1228 is 42 L/s. Measurements represent external dimensions and are indicative of maximum expected gauge along length of the asset.</p> <p>Construction of the pumping stations will include:</p> <ul style="list-style-type: none"> • installation of site boundary fencing and gates • installation of the pumps and equipment • bulk earthworks to establish required levels • piling and shoring works, dependant on excavation depths • installing emergency overflow pipelines, with headwall configuration using open trenching techniques • deep excavation works for the pumping station sub-structure • deep pipework installation via trenchless methods • installation of concrete structures including inlet maintenance hole, wet well, and valve chamber • backfill and installation of shallow pipework and discharge maintenance hole • installation of slab foundations for the OCU, switch room and substation and associated services • building and mechanical fit out works • permanent power supply works • site electrical works • access road, hardstand and ancillary works • site restoration and landscaping • testing and commissioning of the station. <p>Construction of the proposal will involve vegetation clearing and excavation. Impacts will be restricted to within the construction corridor. As outlined in Section 6.2, sensitive environmental areas will be avoided wherever possible, and impacts limited to the proposed scope based on the concept design available at time of reporting. Direct impacts are expected from open trenching, earthworks, and the establishment of compound and/ or laydown areas. Installation of the overflow headwall will involve the disturbance of the</p>

Aspect	Detailed description
	<p>waterways edge, which will be rehabilitated and stabilised as per the Department of Primary Industries and Regional Development (DPI&RD) Fisheries requirements (see Appendix D and Section 6.2.2).</p> <p>Excavated material will be temporarily stored within the construction footprint and ultimately removed from the site if not suitable for reuse during restoration. The excavated material will generally be stockpiled adjacent to excavations and used as backfill. Topsoil will be stockpiled separately and then reused after subsoils have been used for the majority of backfill. While excavated material will generally be used as backfill, it is likely that there will be excess materials, including material generated from trenchless construction. The management of this and other waste material generated by construction is discussed in Section 6.2.1 and 6.2.7).</p>
Commissioning	<p>Commissioning involves testing and running the new equipment to ensure it works correctly and is integrated with existing plant operations. The exact commissioning steps depend on the type of equipment, but typically include:</p> <ul style="list-style-type: none"> • pipelines <ul style="list-style-type: none"> ○ testing pressure leaks and repairing any leaks if found ○ checking all equipment and safety devices ○ performance testing including sampling where required. • pumping station <ul style="list-style-type: none"> ○ testing utilities, telemetry and switchboards ○ inspection and performance testing of equipment, pipes, pumps and fittings ○ testing of any emergency systems in place ○ installing signage and labelling of equipment ○ training operators and prepare maintenance manuals.
Restoration	<p>Non-operational areas of the work site will be restored to the pre-existing condition following construction in consultation with landowners and/or local council. The Construction Environmental Management Plan (CEMP) will detail site restoration works to be undertaken once construction works are finished. Native vegetation removal will be replaced in consultation with Council and offset in accordance with the Sydney Water Biodiversity Offset Guideline. Any required revegetation will be carried out in accordance with Sydney Water procedure <i>SWEMS0025.11 Guideline for native revegetation following construction</i>.</p> <p>Site restoration activities would include:</p> <ul style="list-style-type: none"> • backfilling of trenches as soon as works are finished

Aspect	Detailed description
	<ul style="list-style-type: none"> dismantling compounds, removal and disposal of waste material and removing construction signage restoring ground cover and vegetation restoration of road pavement surfaces and drainage where pipework is trenched into place removing erosion and sediment control, fencing and traffic management measures.

Materials/ equipment

Materials

Typical materials likely to be used include but are not limited to:



- Polyethylene (PE) pipe for the pressure pipelines
- Glass Reinforced Polyester Pipes (GRP) pipe for the gravity pipelines
- pumps and other equipment
- building materials, steel and timber
- fuel for minor plant and equipment
- topsoil, bitumen and concrete
- valves and other fixtures
- concrete for encasement
- granular materials
- reused excavated material for pipe trench fill.

Equipment

Typical equipment likely to be used includes but is not limited to:

- excavators
- rock breakers / jackhammers
- compactors
- padfoot roller / vibration roller
- slurry extractor
- concrete truck and pump
- concrete saws
- drill rig
- microtunneling / HDD equipment
- horizontal auger

Aspect	Detailed description
	<ul style="list-style-type: none"> • backhoe • tipper trucks • bogie / truck and dog • light and heavy vehicles • street sweeper • water truck • cranes • generators • air compressors • skip bins • dump trucks • portable pumps and sediment tank • welding equipment and power • tools (various) • confined spaces safety equipment (e.g. gantry/davit) • site facilities and amenities • storage containers. <p>It is expected that the proposal will require a construction workforce of up to 60 people, and between 30 to 60 vehicle movements at a given time across the alignment.</p>
Work hours	<p>Work and deliveries will be scheduled to occur during standard daytime hours of:</p> <ul style="list-style-type: none"> • 7 am to 6 pm, Monday to Friday • 8 am to 1 pm, Saturdays. <p>Nightwork, whilst not currently planned, may be required for works within/adjacent to roadways to minimise impacts to traffic (pending ROL requirements). Similarly, for safety and/or delivery of oversized equipment, extensive concrete works, or extended dewatering requirements (if needed), work outside these hours may be required.</p> <p>This has been assessed and mitigation measures are provided in Section 6.2.5., 6.2.8, and 6.2.9.</p>
Proposal timing	<p>Construction is expected to start early 2025 and take about two years, with completion early 2027.</p>



Aspect	Detailed description
Operational requirements	<p>Sewage treatment is a scheduled activity. If the USC AWRC is not ready to receive flows, or this action is required during the TCSC Stage 1 construction phase, pump out scours and discharge through tankering would be adopted as required. Wastewater released to scour pits would be pumped directly to tankers and there would be no release to the environment.</p> <p>Once operational, proposed pumping stations will operate largely without the need for permanent presence at the site. The proposal will be subject to standard and routine maintenance activities such as inspections, testing and repairs as necessary.</p>

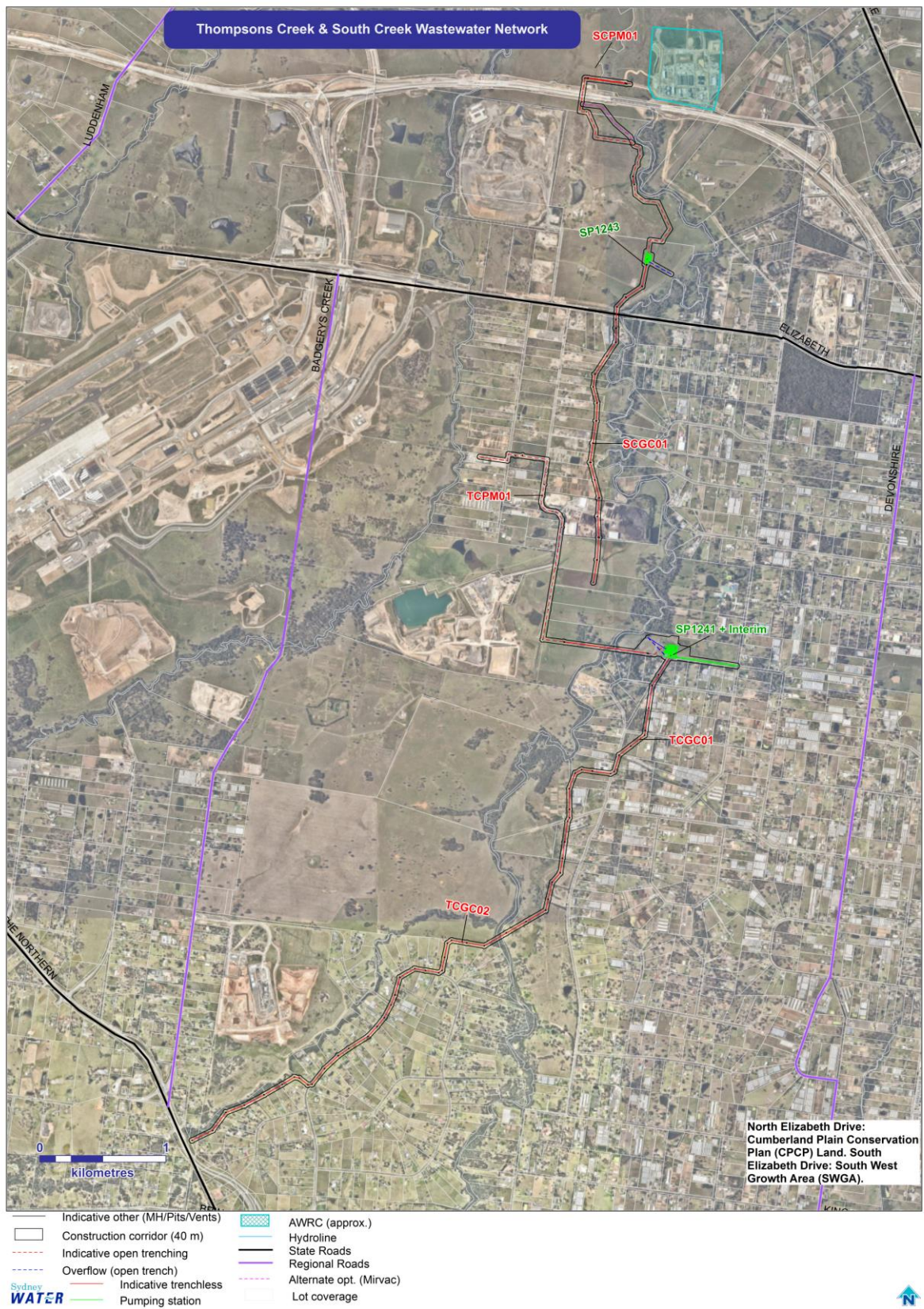


Figure 3-1 Proposal overview.

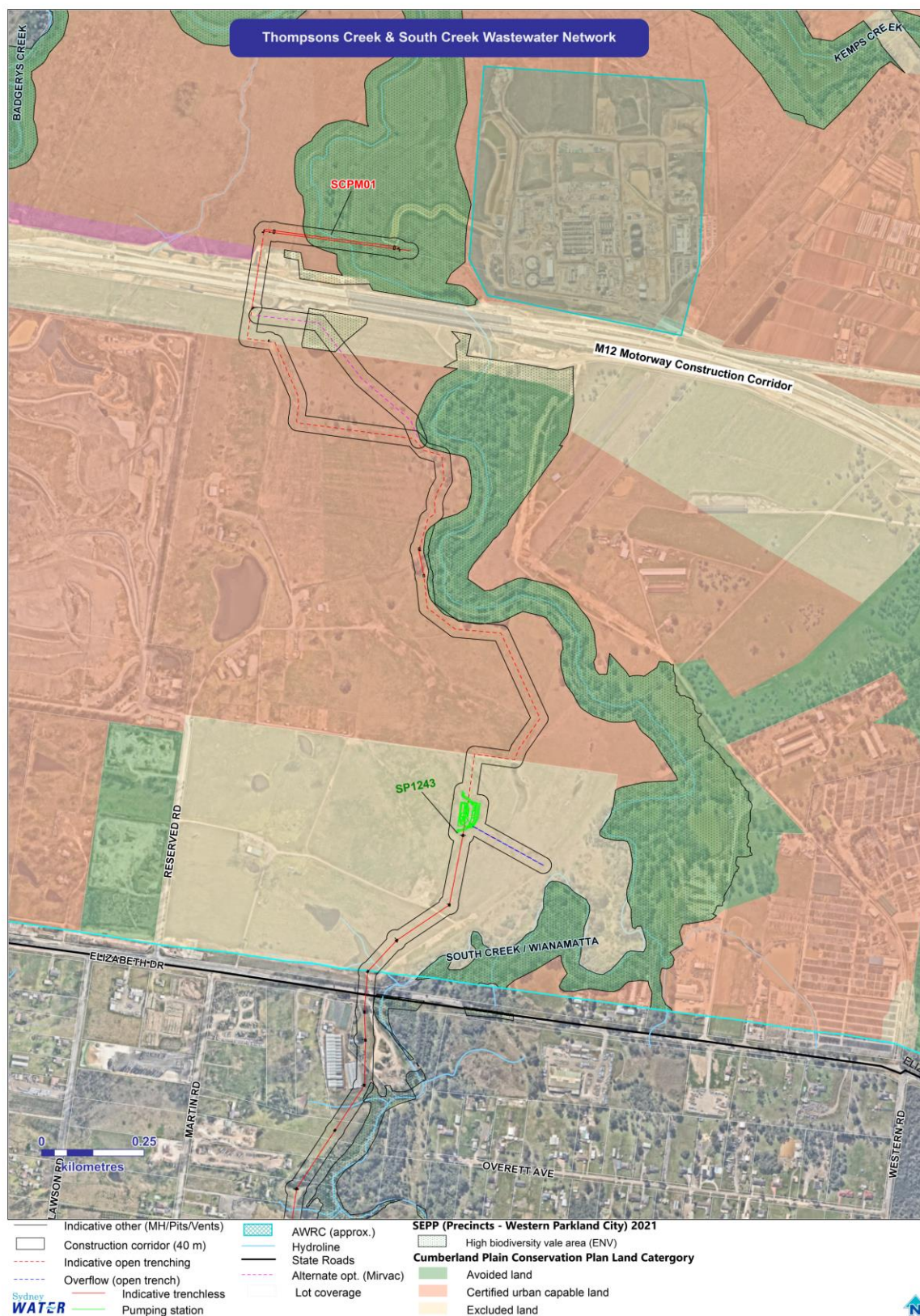


Figure 3-2 Proposal in CPCP.

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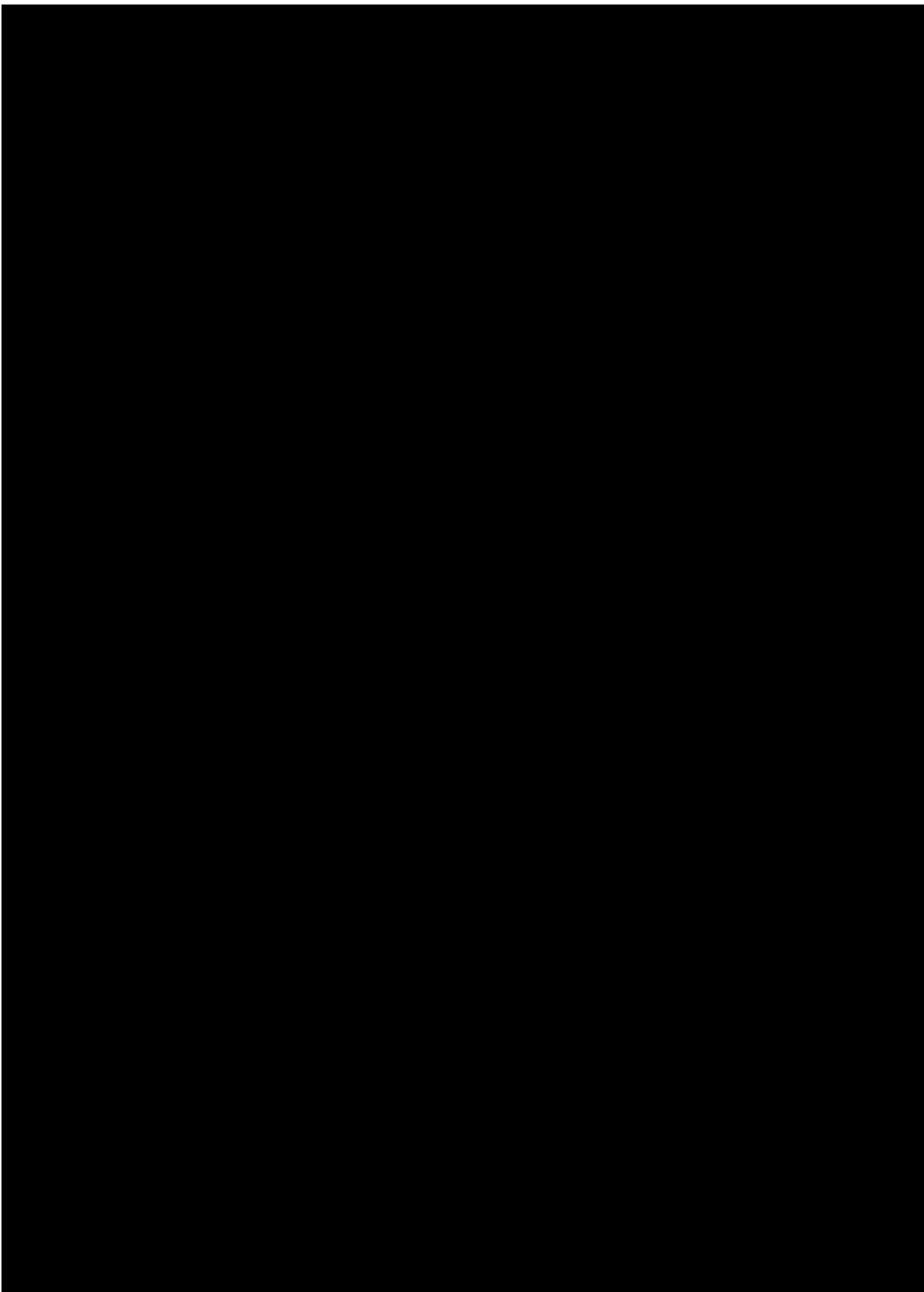


Figure 3-3 Environmental constraints, north of Elizabeth Drive.

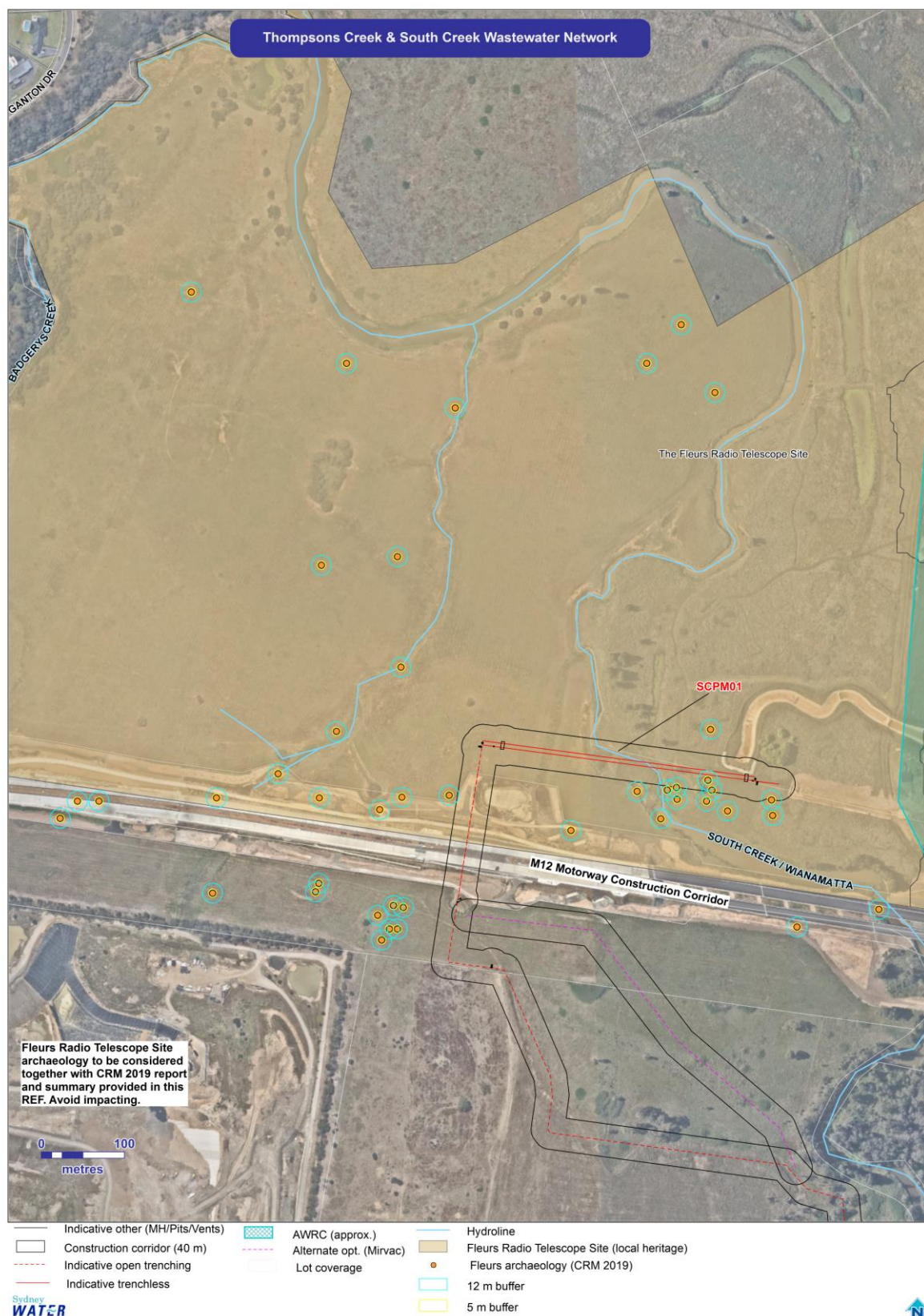


Figure 3-4 Fleurs Radio Telescope Site (local heritage).

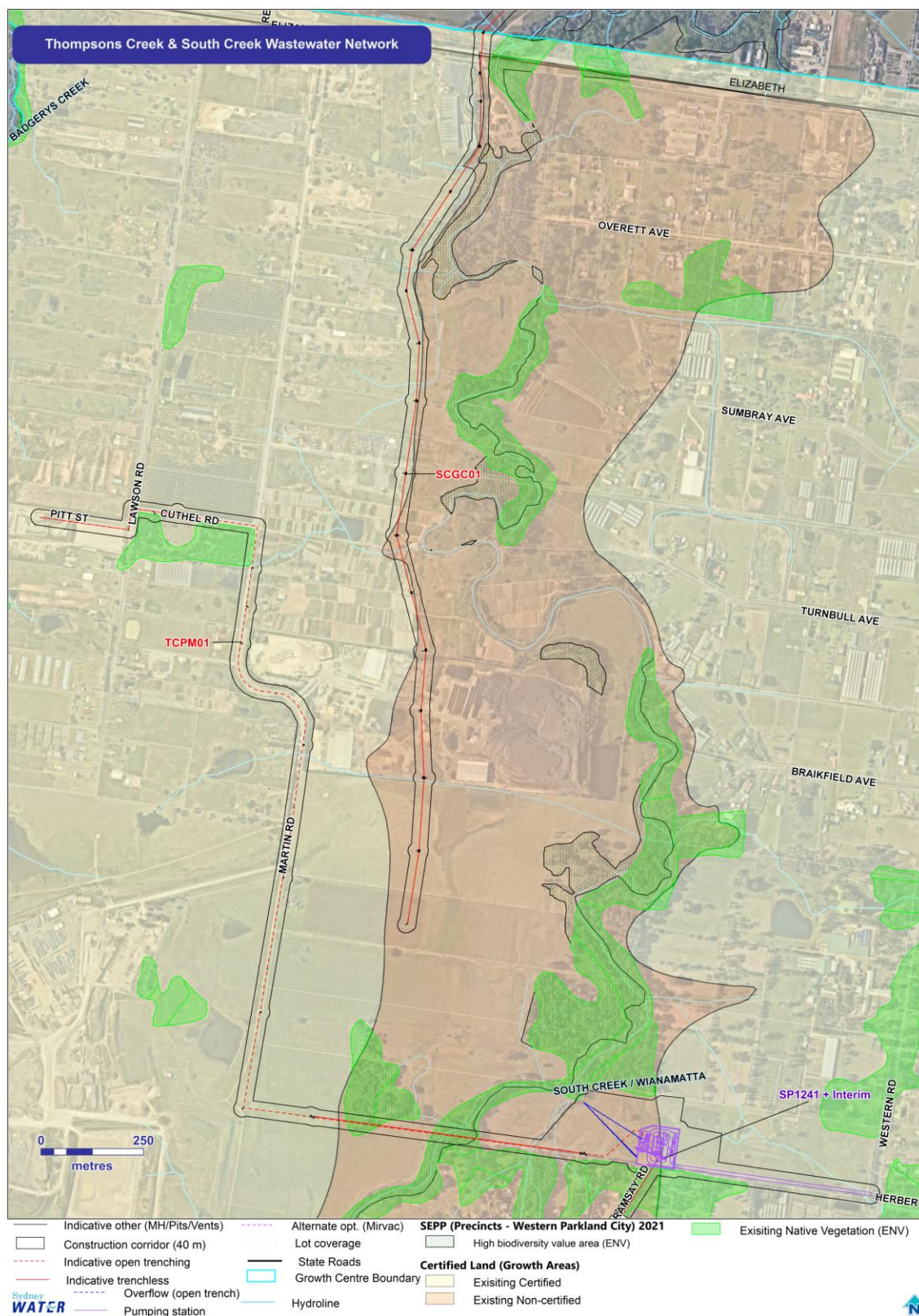


Figure 3-5 Certified Land and high value vegetation.

This information has been redacted to protect sensitive Aboriginal heritage information

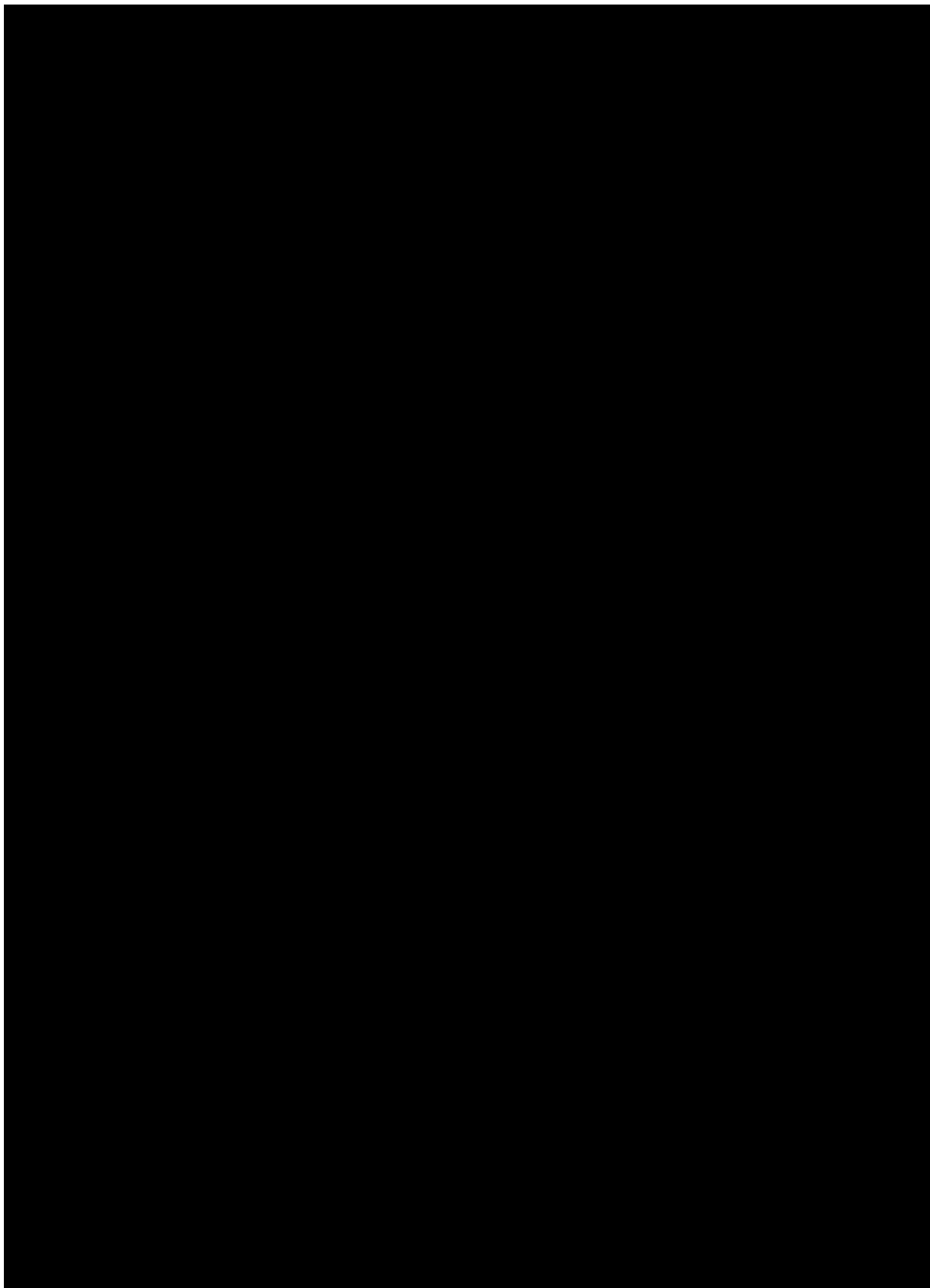
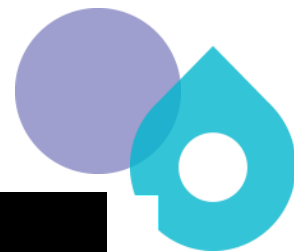


Figure 3-6 Environmental constraints. TCPM01, SCGC01, SP1241 (and interim).



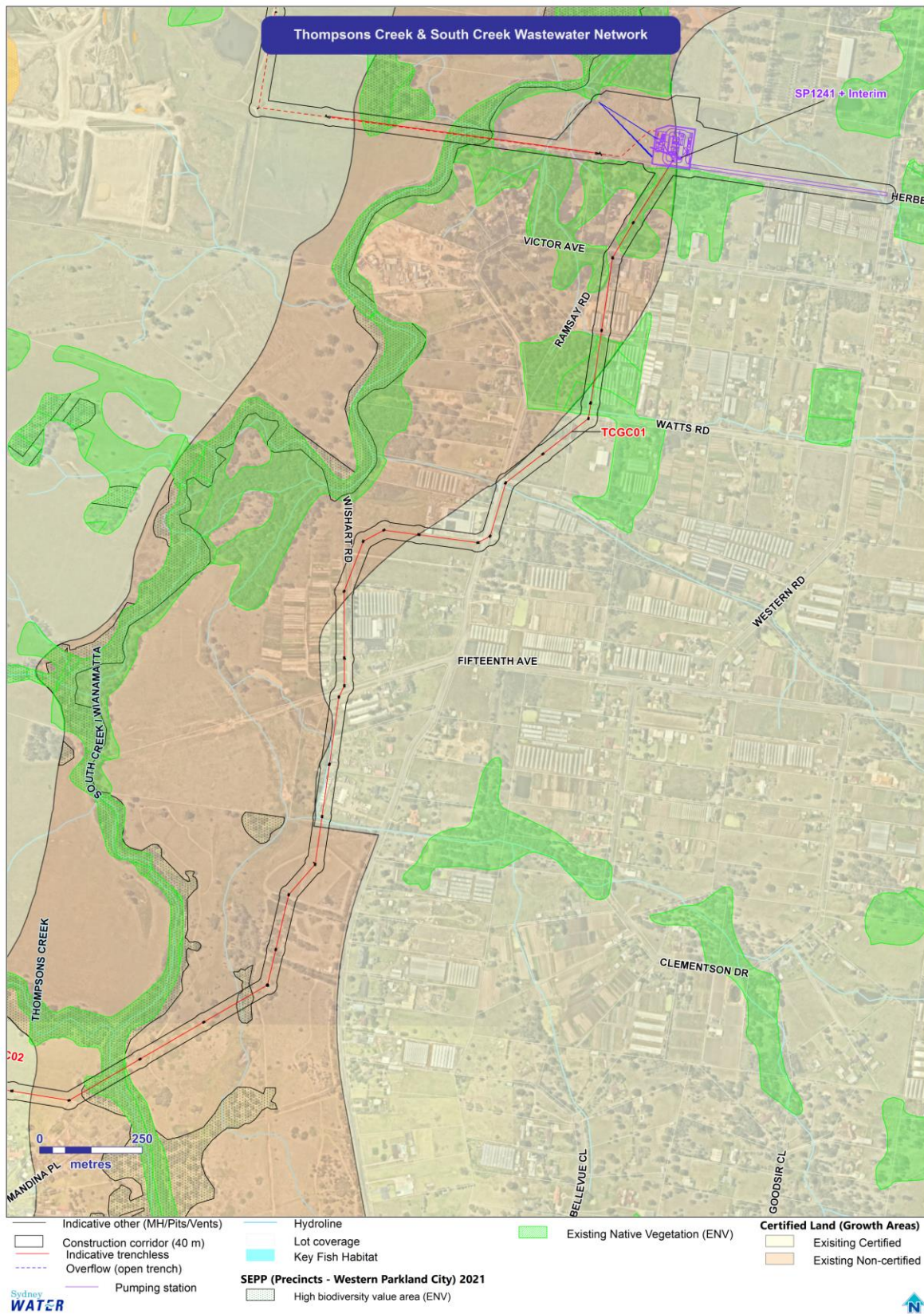


Figure 3-7 Certified Land and high value vegetation. TCGC01 and SP1241 (and interim).



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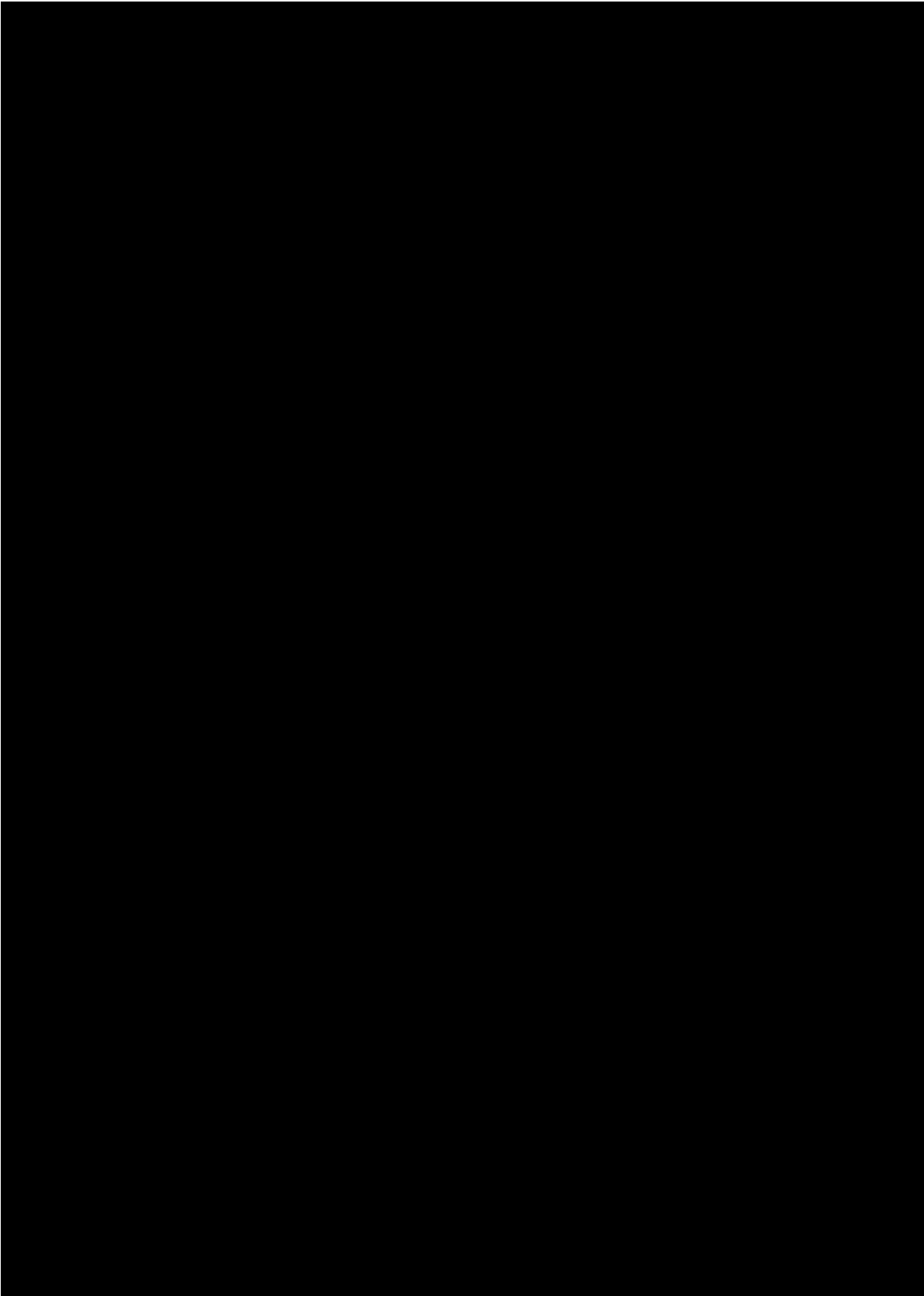


Figure 3-8 Environmental constraints. TCGC01 and SP1241 (and interim).



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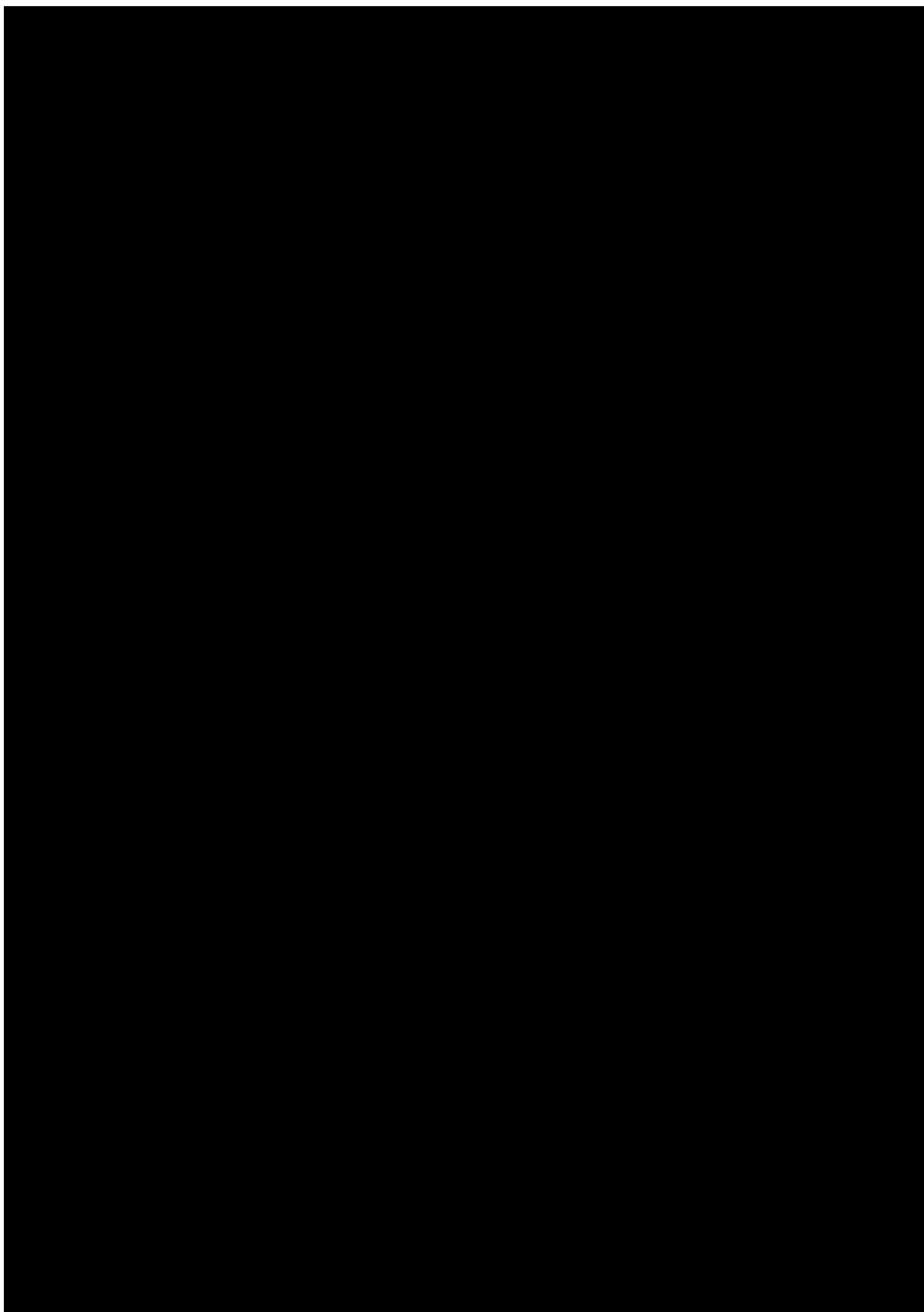


Figure 3-9 Environmental constraints. TCGC01 (southern extent).

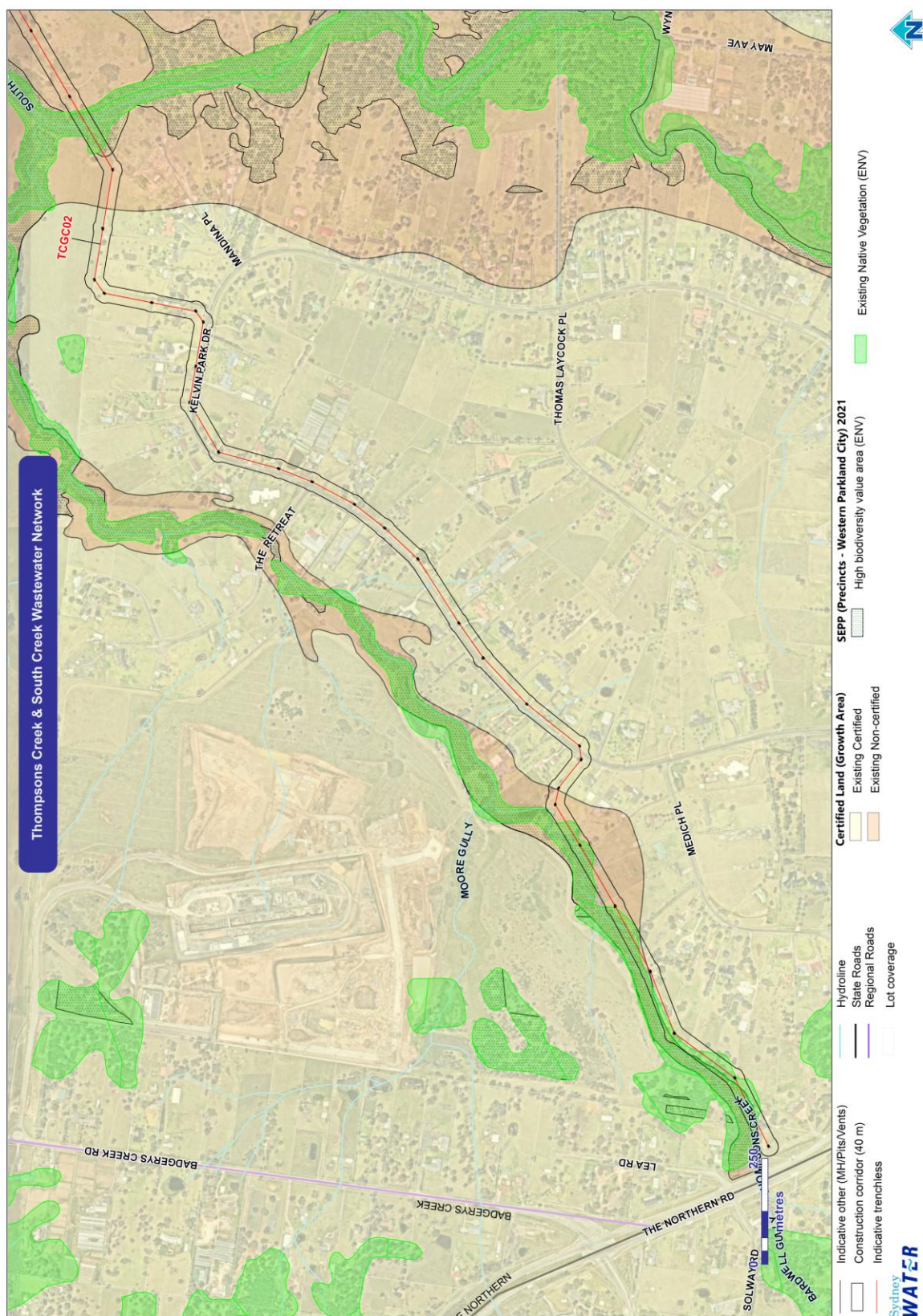


Figure 3-10 Certified Land and high value vegetation. TCGC01 (southern extent).



3.2 Field assessment area and changes to the scope of work

The REF includes a broad study area to provide proposal context where direct and indirect impacts may occur. The direct impact area consists of the construction corridor excluding no-go zones (see Figure 3-1 and Section 6 for discussion).

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 and/ or construction planning. The general mitigation measures outline when changes to the proposal trigger supplementary environmental impact assessment. If required, further assessment must be prepared in accordance with SWEMS0019.

An addendum is not required provided the change:

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

Changes to the proposal outside the construction corridor can 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.

The Contractor will demonstrate in writing how the changes meet these requirements, for approval by Sydney Water's Project Manager, in consultation with the environmental and community representatives.



4 Consultation

4.1 Community and stakeholder consultation

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

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

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

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

We will also provide local councils with reasonable notice when we would like to commence works. Local councils will be consulted about matters identified in environmental planning instruments (refer Section 4.2 below). This includes public safety issues, temporary works on council land, and full or partial road closures of council managed roads.

Sydney Water has undertaken consultation with a range of stakeholders regarding the proposal. The consultation outcomes report related to TCSC Stage 1 is provided in Appendix C ([USCN Community Outcomes Report](#)), and a brief summary included below:

- briefings with government and regulatory entities including:
 - Liverpool and Penrith City Council
 - Transport for New South Wales (TfNSW)
 - Local MPs
 - Bradfield Development Authority (BDA, previously the Western Parkland City Authority (WPCA))
 - Local Aboriginal Land Councils (LALCs).
- regular discussions with developers and landowners via phone and emails to:
 - facilitate access for site investigations
 - provide updates on progress and expected impacts

- provide details around acquisition for pumping station location.
- updates to the Sydney Water Talk webpage
- newsletters sent to the wider community as per consultations outcome report, to provide an update on the program.

Further consultation will be undertaken with both councils and property owners regarding construction activities, access and easements required for the proposal. The broader community will also be informed of the proposed infrastructure and construction activities.

4.2 Consultation required under State Environmental Planning Policies and other legislation

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



Consultation is required under s 210 (1e) and (1f) of the TISEPP as the proposal involves excavation within or adjacent to council managed road. Sydney Water notified Liverpool City Council of the works 18 December 2024. At the time of writing, no response from council has been received. The delivery contractor will continue to consult with Liverpool Council and any requests considered as part of the CEMP. Further detail is provided in Appendix B.

The proposal involves dredging and reclamation within Key Fish Habitat (overflow discharge sites) adjacent to South Creek. Fisheries were notified under s.199 of the *Fisheries Management Act (1994)*, regarding the proposal and have no objections to the proposed works, provided Sydney Water follow their suggested environmental mitigation measures and design requirements (refer to Section 6.2.2 and Appendix D).

Sydney Water consulted with the Bradfield Development Authority (previously the Western Parkland City Authority (WPCA)) on 24 September 2024 as the proposal has a capital investment value of over \$30 million and is in the Western City operational area. A response to our notification was received 15 October 2024. The Authority is supportive of the project and their detailed response, including two requests (refer to Appendix E). Sydney Water responded to the above two requests 05 November 2024, noting:

- The BDA Design and Delivery Framework was provided to Sydney Water's project team for their consideration during design.
- Connections to civil infrastructure within Bradfield City Centre falls outside the scope of this project and REF. A follow up request for Sydney Water to continue to liaise with the Authority was received 05 November 2024 with regards to this matter. Subsequent correspondence on 11 November 2024 confirmed Sydney Water Senior Project Manager, Will Watts, as a suitable contact moving forwards for the Authority Civils Delivery team lead (Tim Hutchinson) to liaise with, regarding future Bradfield City Centre requirements.

The study area occurs within land mapped under the *State Environmental Planning Policy (Precincts - Western Parkland City) 2021* – South West Growth Area, including Chapter 4 Western



Sydney Aerotropolis, and land mapped under the NSW Cumberland Plain Conservation Plan. Further actions and offsetting requirements are dictated by the land categories on which the Impact Area occurs.

- Under the South West Growth Area, impacts to non-certified land require written notice of the proposed clearing to NSW Department of Planning, Housing and Infrastructure. Sydney Water Corporation can meet the intent of the *State Environmental Planning Policy (Precincts— Western Parkland City) 2021* and satisfy the general requirements for offsetting through SWC Biodiversity Offset Guide (Sydney Water Corporation, 2024).
- Under the Western Sydney Aerotropolis, impacts to High Biodiversity Value – Existing Native Vegetation require written notice of the proposed clearing to NSW Department of Planning, Housing and Infrastructure (regardless of the biodiversity certification status of the land), in accordance with *State Environmental Planning Policy (Precincts— Western Parkland City) 2021*.
- Impact Areas include 0.133 ha within Non-certified land – Avoided land under the Cumberland Plain Conservation Plan, and the Project meets the objectives listed in Section 2.3 and Section 3.3 of the Cumberland Plain Conservation Plan (CPCP) Guidelines. Sydney Water Corporation would be required to notify the Planning Secretary to remove trees, including completing a consistency statement.



5 Legislative requirements

5.1 Strategic context

5.1.1 Greater Sydney Region Plan

The Greater Sydney Region Plan – A Metropolis of Three Cities (Greater Sydney Commission, 2018) is a long-term strategic plan for the Greater Sydney area. The plan focuses on developing a more liveable, productive, and sustainable city by dividing the metropolitan area into three interconnected cities:

- the Western Parkland City
- the Central River City
- the Eastern Harbour City.

The 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 plan is structured around the following key strategies:

- infrastructure and collaboration – including investing in water and wastewater infrastructure
- liveability
- productivity
- sustainability.

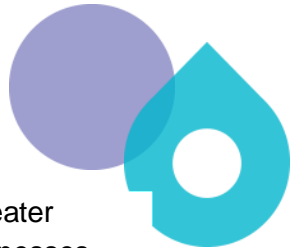

The proposal directly supports the first key strategy area by investing in the delivery of critical wastewater infrastructure in future growth areas. It also supports the other key strategies by:

- improves and expands wastewater servicing to enhance liveability for current and future populations
- enables development and greater productivity opportunities
- improves sustainability of the region by connecting existing wastewater infrastructure to an integrated water cycle.

The proposal is located within the Western Parkland City which is discussed further below.

5.1.2 Western Parkland City Plan of Management 2030

Greater Sydney's population is forecast to reach eight 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 will occur in the Western Parkland City, driven by the new Western Sydney International Airport.



Over the coming years, the region is set to become the economic powerhouse of Greater Sydney. This area will need commercial and industrial developments to host the businesses, residential areas to house the workforce and infrastructure to service their access and utility needs.

The NSW Government's vision for the Western Parkland City is focused on creating jobs, a highly skilled workforce and an innovation economy. However, it also seeks to support a landscape-led approach to new urban communities that will create quality places for the community, keep water resources in the catchment to protect the local climate from heat island effects, value Aboriginal and non-Aboriginal heritage and support the emerging circular economy. Development of the Western Parkland City presents a significant opportunity to maximise productivity, liveability and sustainability.

In the Western Parkland City, the WSAGA and SWGA are expected to be home to up to 650,000 people by 2056. Currently most of the WSAGA and SWGA are not serviced by Sydney Water and use on-site systems such as septic tanks. The proposed new urban communities require water and wastewater services to be established to ensure the anticipated population growth and economic productivity is realised, and to provide equitable servicing across Sydney's metropolitan areas.

New water and wastewater services also bring considerable opportunity to maintain treated water in the local context, enhance the quality of public spaces, the health of the community and environment, and be a focal point for a new circular economy.



In developing a new wastewater service for the region, the proposal is focused on achieving the best outcome for Western Sydney, and therefore for Greater Sydney more broadly. The proposal will enable growth and development of the region and offer wastewater services that our customers expect.

5.1.3 Greater Sydney Water Strategy

The NSW Government developed the Greater Sydney Water Strategy ([DPE, 2022b](#)), which establishes a direction for delivering sustainable and resilient water services to Greater Sydney for the next 20 to 40 years. The strategy sets out priorities and actions for the delivery of water infrastructure into the future to support a sustainable, liveable and productive Greater Sydney.

The Strategy recognises that wastewater management plays a crucial role in achieving a variety of outcomes for the region. Not only does it protect public and environmental health, and help keep our waterways healthy, but it also contains valuable resources that have previously gone unused. Only about 7% of wastewater in Greater Sydney is recycled. Most wastewater is directed to treatment plants and then discharged to the ocean. As Greater Sydney continues to become denser and extend into new areas of growth, the reuse and recycling of wastewater will be essential to support a more productive and sustainable region.

Sydney Water's AWRC will contribute to improving wastewater management and resource recovery from wastewater in Greater Sydney. The AWRC will recover high-quality treated water for environmental flows to waterways, organic material known as biosolids for use as an alternative to chemical fertilisers in farming and gardening, use industry-leading technology to harness renewable energy from co-generation processes, and enable other sustainable practices.



The proposal will 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.

5.1.4 Unlocking the circular economy in the Western Parkland City (Sydney Water)

The Western Parkland City is the largest greenfield development in NSW. As the city grows and evolves, the circular economy will play a vital role in ensuring that it becomes a resilient and sustainable city, and a place people where people want to live, work and visit.

Sydney Water's USC AWRC is being constructed at the heart of the Western Parkland City and presents a unique opportunity to activate a broader circular economy ecosystem for the management of water, energy and resources.

The "Unlocking the Circular Economy in the Western Parkland City" document emphasizes the importance of sustainable resource management and innovative infrastructure. The introduction of a new wastewater main and pumping stations in the Western Parkland City aligns with these circular economy principles. By directing wastewater to the USC AWRC, the proposal will enable efficient water recycling and resource recovery. This not only reduces waste but also supports the integrated water cycle process, enhancing the city's resilience and sustainability. Such initiatives demonstrate a commitment to creating a circular city where resources are continuously reused, benefiting both the environment and the local economy.

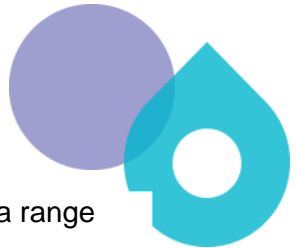

5.1.5 Local Strategic Planning Statements

The proposal is located within the LGA of Liverpool City Council and Penrith City Council. Both councils have prepared a Local Strategic Planning Statement (LSPS) in accordance with Section 3.9 of the EP&A Act. The LSPS guides land use planning in the LGA, taking into consideration economic, social, and environmental factors.

Each LSPS outlines a vision for the future of land use for their respective local government area, focusing on sustainability, liveability, and growth. The statements identify key directions, such as promoting sustainable development, enhancing community infrastructure, supporting economic development, and preserving the natural environment. The plans 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.

Penrith LSPS acknowledges the significant role Sydney Water has, to ensure that the growth areas within the LGA can be adequately serviced. It also notes that some of the growth areas, such as the WSA, currently either lack the water-related infrastructure to cater for growth or are limited in their ability to provide additional capacity. Sydney Water is planning water and wastewater infrastructure throughout the region and is delivering critical assets to support the wider network that will service areas of growth. This includes the AWRC and the proposal that will unlock the potential to service a substantially greater population in Western Sydney.

Liverpool LSPS contains several planning priorities that relate to infrastructure and aligning with growth while being sustainable and protecting the natural environment. Planning priority 15 aims for Liverpool to be a green, resilient and water-sensitive city. The proposal will support this priority, by providing a means for wastewater from the surrounding area to be transferred to the AWRC.



The wastewater will then be treated to a high-quality that will be suitable for reuse in a range of applications.

Additionally, given most of the proposal will be located below ground, it is unlikely to affect a council's ability to implement any potential 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 5-1) and legislation (Table 5-2) are relevant to the proposal. Table 5-2 also documents any licences and permits required, and timing and responsibility for obtaining them.

Table 5-1 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
State Environmental Planning Policy (Precincts—Western Parkland City) 2021 (Western Parkland City SEPP)	The proposal is located within the LGAs of Liverpool and Penrith City Councils; however, the land is zoned under the SEPP (Precincts – Western Parkland City) 2021.
Liverpool Local Environmental Plan 2008	The proposal is located on land zoned: <ul style="list-style-type: none">• ENZ Environment and Recreation• MU Mixed Use• RE1 Public Recreation• RU4 Primary Production Small Lots• ENT Enterprise• SP2 Infrastructure.
Penrith Local Environmental Plan 2010	
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	<p>Section 2.126(1a) of the TISEPP defines a prescribed circumstance as development carried out by or on behalf of a public authority. Section 2.126(6) of the TISEPP permits development by or on behalf of a public authority for sewage reticulation systems without consent on any land in the <i>prescribed circumstances</i>.</p> <p>As Sydney Water is a public authority, the proposal is permissible without consent.</p>
State Environmental Planning Policy (Precincts—Western Parkland City) 2021 (Western Parkland City SEPP)	<p>Sydney region growth centres (Chapter 3)</p> <p>The Western Parkland City SEPP coordinates the release of land for residential, employment and other urban</p>

Environmental Planning Instrument	Relevance to proposal
	<p>development, in the Western Parkland City area. Chapter 3 applies to growth centres, including the SWGA.</p> <p>The southern portion of the proposal (south of Elizabeth Drive) is located within the SWGA and is subject to the conditions of the Biodiversity Certification Order (BCO) of the former <i>State Environmental Planning Policy (Sydney Region Growth Centres) 2006</i>. 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 EP&A Act. 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.</p> <p>Impacts to vegetation within non-certified land require written notice of the proposed clearing to the NSW Department of Planning, Housing and Infrastructure and consideration given to any response received within 21 days of the notice. Within non-certified land, 0.574 ha of ENV is proposed to be impacted (worst-case scenario). Sydney Water will notify DPHI prior to construction and consideration to their comments will be incorporated into the project CEMP.</p> <p>Western Sydney Aerotropolis (Chapter 4)</p> <p>The proposal is located within land to which Chapter 4 of this SEPP applies. The proposal is located on land zoned as Environment and Recreation (ENZ). As per Subsection 4.5, the provisions of the SEPP (Infrastructure) 2007 (now TISEPP) still apply as the proposal does not meet the exceptions noted in that clause. Therefore, the proposal can be undertaken without development consent.</p>
<p>State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BCSEPP)</p>	<p>Vegetation in non-rural areas (Chapter 2)</p> <p>The proposal is in an area or zone listed in subsection 2.3(1). However, subsection 2.4(1) states: '<i>This Policy does not affect the provisions of any other SEPP...</i>', and as the works are permissible under the TISEPP, a council permit to clear vegetation under this SEPP is not required.</p> <p>Koala habitat protection 2021 (Chapter 4)</p> <p>Chapter 4 of this SEPP applies to the local government area of Liverpool, however subsection 4.4(3) provides that the Chapter does not apply to land on which biodiversity</p>

certification is in force. As the proposal within the Liverpool local government area is on land to which a biodiversity certification is in force, this Chapter does not apply.

Water catchments (Chapter 6)

Chapter 6 of this SEPP applies as the proposal is within the Hawkesbury-Nepean Catchment, a regulated catchment area. General planning considerations, policies and strategies concern potential impacts to matters including potential environmental impacts on water quality and quantity, aquatic ecology, flooding, access, cultural heritage, flora and fauna, and scenic quality. These and other environmental matters have been considered in the environmental assessment in Section 6.

Strategic conservation planning (Chapter 13)

The works are within the CPCP area.

Chapter 13 of the BCSEPP sets out planning controls to achieve the development and biodiversity outcomes of the [CPCP](#) released by the DPE in August 2022.

The CPCP establishes several land categories to which certain planning controls are applied:

- Avoided Land (not certified for development)
- Strategic Conservation Area (not certified for development)
- Certified - Urban Capable Land (certified for development)
- Certified – Major Transport Corridors (certified for development)
- Major transport corridors (strategically assessed only, not certified under the BC Act through the CPCP, however, have been included for approval under the EPBC Act)
- Excluded land (land that is excluded from the NSW strategic biodiversity certification and strategic assessment under the EPBC Act, and therefore does not receive any approvals under the CPCP).

Any parts of the proposal on avoided land must follow the notification and reporting requirements in Section 201A of the *Environmental Planning and Assessment Amendment (Avoided Land) Regulation 2022*. Sydney Water has taken

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into consideration the requirements of this Chapter. Refer to Section 6.2.3 of the REF.

Cumberland Plain Conservation Plan Guidelines for Infrastructure Development 2022 (CPCP)

The proposal is located on land classified under the CPCP as:



- certified – urban capable land
- excluded land
- certified – major transport corridor
- avoided land.

The proposal has been designed to minimise native vegetation impacts on avoided land and meets the objectives listed in Section 2.3 and Section 3.3 of the CPCP, so no restrictions apply to these activities.

Table 5-2 Consideration of key environmental legislation



Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
<i>Protection of the Environment Operations Act 1997 (POEO Act)</i>	<p>Sewage treatment is a scheduled activity under the Act.</p> <p>The new wastewater infrastructure is dependent on the completion of adjacent catchment projects in planning or construction, to service the SWGA. All flows from the current proposal will ultimately connect to the USC AWRC and will be operated under the future USC Networks EPL. As works are not connected to an existing licensed system during construction, a scheduled development work licence under s47 of the POEO Act is required.</p> <p>The existing scheduled development work licence (EPL 21886 - Upper South Creek Networks) will be varied to include this proposal. Prior to operation the proposal will be covered by a scheduled activity EPL for USC catchment and AWRC.</p>	<p>Scheduled Development Work EPL variation (s47)</p> <p>Scheduled activity EPL (s48)</p>	<p>Pre-construction, Sydney Water</p> <p>Pre-operation, Sydney Water</p>

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
<i>Biodiversity Conservation Act 2016 (BC Act)</i>	<p>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.</p> <p>Section 7.3 the BC Act requires that the significance of the impact on threatened species and endangered ecological communities or their habitats is assessed using a five-part test. Where a significant impact is likely to occur, a species impact statement (SIS) must be prepared in accordance with the Environment Agency Head's requirements, or a Biodiversity Development Assessment Report (BDAR) must be prepared by an accredited assessor in accordance with the Biodiversity Assessment Method (BAM).</p> <p>Assessments of significance were conducted for threatened entities with the potential to occur in the study area. These assessments concluded that the proposed works are unlikely to result in a significant impact. Further information is provided in Appendix H.</p> <p>Biocertification</p> <p>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.</p> <p>The proposal is partly located within land certified under the SWGA and the CPCS. The impact of the project on threatened species, communities and their habitats in non-certified land is described in Section 6.2.3. Significant impacts to threatened species or communities are unlikely.</p>	REF (and consent from Minister if needed)	Pre-construction, Sydney Water






Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
<i>National Parks and Wildlife Act 1974 (NPW Act)</i>	<p>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.</p> <p>The proposal is not within National Parks, State Conservation areas or nature reserves.</p> <p>Under Section 86 of this Act, it is an offence to harm or desecrate an Aboriginal place or object unless authorised by an Aboriginal heritage impact permit (AHIP) or where it is reasonably determined that no Aboriginal object would be harmed.</p> <p>Under Section 90(1) of the Act “the Director-General may issue an Aboriginal heritage impact permit”. An AHIP is required for an activity which will harm an Aboriginal object.</p> <p>An Aboriginal heritage assessment report (ACHAR) was undertaken for the REF (Appendix I). Based on the results of the test excavation and impact assessment, nine (9) archaeological sites were identified to be at least partly impacted. Therefore, an AHIP under Section 90 of the NPW Act is required.</p> <p>Additionally, portions of the proposal intersect areas subject to AHIPs or Approvals granted to other parties (see Section 6.2.4). Harm in these areas is subject to the conditions issued in these existing AHIP/Approval documents. Sydney Water should seek approval from the AHIP/Approval holder prior to commencing any work.</p> <p>Aboriginal heritage is described in Section 6.2.4.</p>	AHIP / existing approvals	Post REF, pre-construction, Sydney Water (for AHIP)

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
<i>Heritage Act 1977</i>	<p>The <i>Heritage Act 1977</i> provides protection for those items of environmental heritage (Aboriginal and historic-period) that are of value to the state of New South Wales.</p> <p>As part of the REF process, a Section 139(4) exception form has been completed in consultation with Sydney Water's Senior Heritage Advisor to document the due diligence process (Appendix F). Heritage impacts are further described in Section 6.2.4. Chance discovery of relics must be notified to the Heritage Council of NSW by means of an s146 notification.</p>	s.139(4) REF	Preconstruction, Sydney Water
<i>Fisheries Management Act 1994 (FM Act)</i>	<p>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 or harming marine vegetation.</p> <p>The proposal will require dredging and reclamation of KFH. Under s.199 of the FM Act a public authority can carry out dredging or reclamation work without a permit provided that:</p> <ul style="list-style-type: none"> the Minister is given written notice of the proposed work they 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). <p>In accordance with s.199 of the FM Act, the proposal was referred to Fisheries for comment 8 April 2024 and 11 November</p>	Notification	Pre-construction, Sydney Water

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	<p>2024. Fisheries responded on 16 May 2024 with consultation advice, including 12 requirements and 22 November 2024 with 3 additional requirements. After consultation with the project team, including the project manager, Sydney Water responded and accepted Fisheries requirements (Appendix D).</p>		
<i>Water Act 1912/ Water Management Act 2000</i>	<p>Under Section 91B of the WM Act, Sydney Water is required to obtain a Water Supply Work Approval (WSWA) for the temporary dewatering of groundwater.</p> <p>In addition, a Water Access Licence (WAL) (section 60A) would be required if more than three megalitres (ML) of groundwater is likely to be extracted per water year, in accordance with Schedule 4 of the Water Management (General) Regulation 2018. If a WAL is required, water shares must be secured prior to works commencing.</p> <p>Given the scale of works and depths of excavation, it is possible that groundwater will be intercepted, and dewatering required. Based on desktop and field-based site investigations, groundwater is expected to be encountered during construction at depths greater than 1.6 m below existing ground level. At the time of writing, the anticipated volume of groundwater required to be dewatered is 37 ML. A dewatering management plan is being developed, and the regulator will be consulted as required.</p>	WSWA (for <3ML) and WAL (for >3ML)	During or post REF if known during planning (Sydney Water to initiate). If unknown, pre-construction, contractor.
<i>Roads Act 1993</i>	<p>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. Much of the alignment passing through open fields or uses trenchless construction methods. A Road Occupancy Licence (ROL) would be required from the relevant</p>	ROL	Pre-construction, contractor

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	roads authority prior to work on public roads and any temporary road closures during construction of the proposal.		
<i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i>	<p><i>The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i> is the principal environmental law administered by the Commonwealth. It provides for the protection of matters of national environmental significance. Under the EPBC Act, an action that is likely to have a significant impact on a matter of national environmental significance (MNES) must be referred to the Commonwealth Minister for Climate Change, Energy, the Environment and Water.</p> <p>The Flora and Fauna assessment (Appendix H) concluded that the proposal was unlikely to have a significant impact on MNES and accordingly, referral is not required.</p> <p>Section 6.2.3 provides further details on the proposal's potential impact to threatened ecological communities and species.</p>	Referral (not required)	Pre-construction, Sydney Water



6 Environmental assessment

Section 6 describes the existing environment and assesses direct and indirect impacts of construction and operation. It also identifies mitigation measures to minimise impacts. These will be incorporated into contract documents and a Construction Environmental Management Plan (or similar) prior to starting work.

6.1 Existing environment

The proposal is located within four suburbs, two LGAs and several development precincts. The alignment generally runs through rural, vegetated and/or agricultural lots. Sections of the alignment will cross the major road corridor of Elizabeth Drive. The existing land use is mostly rural/agricultural previously cleared for pastoral use and intensive grazing of cattle. The proposal largely avoids environmentally sensitive areas and minimises impacts to private property. Environmentally sensitive areas include nearby waterways and associated riparian areas. Much of the remnant native vegetation tends to be accumulated along the waterways and consists of threatened ecological communities.

Aboriginal heritage sites are found throughout south western Sydney, particularly near waterways. Limited non-Aboriginal heritage is within the vicinity of the proposal, however, the northern section of the alignment crosses the curtilage of Fleurs Radio Telescope Site (locally listed).

The environmental features within and adjacent to the study area are detailed in Section 6.2.

6.2 Environmental aspects, impacts and mitigation measures



6.2.1 Topography, geology and soils

Existing environment and potential impacts

Investigations were undertaken to assess existing soil and surface conditions along the proposal and within areas planned for pumping stations with a view to understanding hazards to human and environmental health and waste classification of excavated materials. This included a preliminary site investigation (PSI), detailed site investigation (DSI), and geotechnical desktop study (GDS) (SWPP 2023a; SWPP 2023b, SWPP 2023c). A summary of these reports follows.

The project area is located within the western portion of the Sydney Basin and is mostly underlain by Bringelly Shale of the Wianamatta Group, with alluvial floodplain deposits along the banks of Badgerys Creek. The pipeline alignments typically follow the boundary of residual soils and alluvium and is underlain by the South Creek Alluvial deposits and Blacktown Residual soils. These soil landscapes have moderate to high erodibility.

The topography of the broader area is relatively flat, with gentle undulations and elevations dipping from 70 m AHD in the south to 40 m AHD in the north. The elevations decrease towards the creeks that run through the area.



According to the Map of Salinity Potential in Western Sydney (2002) much of the site is within an area of moderate to high salinity potential. A search of the Australian Soil Resource Information System (ASRIS) identified that the proposal is in an area with extremely low probability for Acid Sulfate Soils (ASS). No known contaminated sites were identified within the construction corridor from a search of the EPA Contaminated Land Record undertaken on 27th March 2024.

A DSI was carried out by Sydney Water's Planning Partner (SWPP 2023c) at targeted locations with sampling conducted to determine if contaminants of potential concern (COPCs) are present in soils and groundwater within the study area at levels exceeding acceptance. The DSI included a review of available background and historical information for the site including review of the previous PSI prepared for the project (SWPP 2023a). The field investigation was based on results of the PSI and included soil and groundwater sampling from a total of 70 sampling locations and 16 installed groundwater monitoring wells.



Results of analyses did not identify any COPCs within soil across the site at concentrations above the applicable Tier I human health investigation levels (ILs) for the land use in any of the tested locations. Similarly, it was determined that there are no unacceptable risks to human health during proposed earthworks and construction. Concentrations of nickel and benzo(a)pyrene in fill soils at four locations within the alignment exceeded ecological ILs, but the chance that there are unacceptable ecological risks from these Ecological Investigation Levels (EIL) exceedances was considered unlikely.

The depth to groundwater was measured between about 1.635 to 7.552 mbgl in the 16 newly installed groundwater monitoring wells during sampling. Concentrations of dissolved heavy metals (cadmium, copper, nickel and zinc) and ammonia in groundwater samples were identified above the adopted guideline levels. Presence of these heavy metals and ammonia in groundwater appear to be indicative of naturally occurring background concentrations and were not considered to pose a risk to on-site receptors.

Impacts may remain present within areas of the site which were not investigated as part of the DSI. Any unidentified contamination risks during earthworks and construction should be managed via mitigation measures outlined in Table 1 and must be included as part of the future contractor's CEMP.

Potential construction impacts

During construction, proposed activities will disturb the ground, remove vegetation, excavate, and stockpile soil which could result in potential offsite erosion and sedimentation of surrounding land and waterways. Typical trench dimensions will be up to 6 m deep and 2 m wide. The maximum trenchless depth is expected to be 22 m. The dimensions of the launch and retrieval pits will be about 4 m wide and up to 10 m in length, depending on method applied (e.g. HDD, microtunnelling; single or dual pipe). Compound and laydown areas are required and will likely disturb the surface layer of the ground, with plant, crew, and spoil moving through the site. Compound/laydown locations are expected to require an area up to 40 m wide and 60 m in length around each pit/MH site. Deep excavation is required to construct pumping stations. The wet well would be up to 23 m deep and 4 m in diameter maximum, depending on pumping station location.



Construction activities would be staged to minimise the extent of soil disturbance at any given time and disturbed areas would be stabilised and reinstated as soon as practical. Erosion and sediment controls would be implemented to prevent the migration of sedimentation downstream of the work site, especially where excavating in proximity to creek lines and their tributaries (refer to Table 6-1 for mitigation measures).

The excavation works associated with the proposal would occur in areas with moderate to high potential for salinity. The disturbance of saline soils has the potential to impact the local environment if not managed appropriately. Transfer of saline sediments offsite has the potential to impact sensitive receiving environments, including waterways and flora and fauna.

Implementation of the safeguards and mitigation measures outlined in the following section would ensure that impacts associated with improper management or re-use of excavated soils are avoided during construction and impacts from salinity are considered unlikely.

Potential operation impacts

Generally, the works are not proposing to permanently change the surface topography and drainage patterns of the area. Construction of the pumping stations aboveground infrastructure, however, may cause permanent but localised changes to these features. The rest of the proposal area will be returned to its original topography and drainage pattern following construction. No topography, geology or soil impacts are anticipated during operation.

Sydney Water will maintain the proposal during operation, and this may involve localised excavation to expose assets. Erosion and sedimentation mitigation measures will be implemented to ensure that maintenance activities have minimal impact on soils.

Overflows from the overflow discharge sites and stormwater outlet will be directed from SP1243 and SP1228 (SP1241) to South Creek. There is a risk that discharge and additional surface water flows could result in scouring and increased erosion. The risk of erosion and turbulence from overflow events would be minimised during detailed design by incorporating erosion protection measures into the structures. In addition, overflow events would only occur during wet weather and infrequently as per future EPL requirements. No vegetation will be cleared downstream of the overflow discharge sites (see Section 6.2.3), which would also help to dissipate flows and protect from erosion.

There is a minor risk of soil contamination due to spills of any chemicals stored at SP1243 and SP1228 (SP1241) for the CDU. This risk would be minimised by storing all chemicals in bunded and sealed areas and by ensuring that the storage area is designed in accordance with the relevant standards.

Mitigation measures

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

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

Mitigation measures
<p>Prevent sediment moving offsite in accordance with Managing Urban Stormwater, Soils and Construction, Volume 1 and 2A (Landcom 2004 and DECC 2008), including:</p> <ul style="list-style-type: none">• develop a Soil and Water Management Plan (SWMP) as part of the CEMP• divert surface runoff away from disturbed soil and stockpiles• install sediment and erosion controls before construction starts• reuse topsoil where possible and stockpile separately• inspect controls at least weekly and immediately after rainfall• rectify damaged controls immediately• remove controls once surfaces have been stabilised, including removing trapped sediment in drainage lines. <p>Include a Stockpile Management Plan (SMP) as part of the SWMP to adequately manage any proposed temporary and permanent stockpiles. This will include detail on:</p> <ul style="list-style-type: none">• 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• restoration. <p>The Stockpile Management Plan will be prepared by the Delivery Contractor and approved by the Sydney Water Project Manager in consultation with the Environmental Representative and Contamination and Hazardous Materials team.</p> <p>Minimise ground disturbance and stabilise disturbed areas progressively.</p> <p>Contractor to ensure imported material is Virgin Excavated Natural Materials (VENM) or meets a relevant NSW EPA Resource Recovery Order and Resource Recovery Exemption, or is a commercially supplied material that is not waste.</p> <p>If using materials that are subject to a NSW EPA Resource Recovery Order/Exemption the Delivery Contractor must ensure the conditions in that Order/Exemption are strictly adhered to.</p> <p>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. Sydney Water Project Manager to contact Sydney Water's Contamination and Hazardous Building Materials team for advice regarding management options.</p>

Mitigation measures

Stop work during heavy rainfall or in waterlogged conditions when there is a risk of sediment loss off site.

Sweep up any sediment/soil transferred off site at least daily, or before rainfall.

Eliminate ponding and erosion by restoring natural landforms to the pre-works condition.

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 before 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.

Where required, disturbed soil is to 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.

Manage acid sulfate soils in accordance with the Acid Sulfate Soils Management Advisory Committee: Acid Sulfate Soils Assessment Guidelines (ASSMAC, 1998).

Adopt appropriate soil salinity mitigation measures in accordance with Western Sydney Salinity Code of Practice (Western Sydney Regional Organisation of Councils, 2003). This may include:

- (if relevant) treat existing salinity with gypsum
- (if relevant) 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.

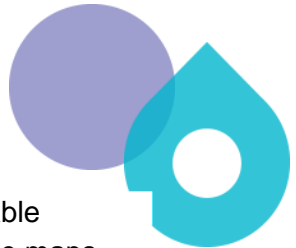

6.2.2 Water and drainage

Existing environment

Water and drainage conditions of the environment were considered in the project's DSI report (SWPP 2023c), with details summarised below.

Surface water and flooding

The project area runs adjacent to South Creek and Thompsons Creek, which are part of the Hawkesbury-Nepean catchment area, and both are KFH. Thompsons Creek discharges into South Creek. Both creeks flow north. There are several minor unnamed water courses, ponds and man-made reservoirs, or dams in the vicinity of the proposal. The alignment runs adjacent to and intersects several unnamed ponds.



Flood maps for South Creek and Thompsons Creek from flood studies publicly available from Penrith City Council and Camden Council were used to inform this review. These maps show that the proposed alignments and pumping stations are generally bordering, or are partially within, the extent of a 1:100 ARI (1% AEP) flood.

Groundwater

Regional groundwater flow direction is expected to be consistent with the topography, moving towards South Creek or Thompsons Creek. These waterways are designated high potential and moderate potential groundwater dependent ecosystems (GDEs), respectively. Terrestrial GDEs (patches of remnant vegetation) are present within the broader area, generally along creeklines, and overlap the construction corridor in places. There are no recognised subterranean ecosystems present within the study area.

Potential construction impacts

Surface water and flooding

Poor site management may lead to potential sedimentation impacts to local waterways including Thompsons Creek and South Creek. The use of trenchless techniques would mitigate impacts to surface water drainage patterns. To minimise any adverse impacts to water quality, creek crossings will be performed using trenchless methods.

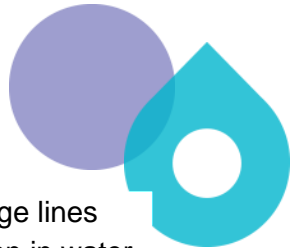

The proposal requires the disturbance of groundcover, trenching and excavation of soils (including areas with moderate to high potential for salinity), the establishment of temporary soil stockpiles and storage of fuels and chemicals. These activities increase the risk of sediment-laden runoff from erosion of stockpiles and the destabilising of creek banks, which has the potential to enter waterways and cause turbidity and enhanced sedimentation. This could result in decreased light levels for submerged aquatic vegetation and smothering of benthic organisms.

Construction of the alignments will not directly impact the watercourses as they will be installed via trenchless methodologies. Trenchless construction has the potential risk of a frac-out (drilling intercepting faults and fractures in the rock) or spills where drilling fluid escapes the bore and enters the environment. The micro tunnelling process will include monitoring of the pressure of the drilling fluid to determine if there is a sudden decrease in pressure which indicates that a frac-out has occurred. The CEMP will include contingency measures to be implemented in response to a frac-out.

The proposal is not likely to adversely affect flood behaviour given the works:

- generally would not permanently change surface topography and drainage patterns
- would occur largely outside flood prone areas
- construction works would be temporary and move along the alignment.

During periods of high rainfall, there is the risk that higher water levels in the creeks and surrounding flooding may impact on construction. Flooding has the potential to increase soil erosion and siltation from the construction site. Pollutants such as sediment, soil nutrients,



construction waste, chemicals and gross pollutants have the potential to enter drainage lines and creek systems, particularly during high rain events. This could result in a reduction in water quality.

Spillage of fuel during refueling and leakage of hydraulic and lubricating oil from plant and equipment, rinse water from plant washing and concrete slurries would have the potential to enter drainage lines. This could potentially result in a decline of water quality. Control of construction water run-off would therefore be necessary to avoid these potential impacts to surrounding waterways.

Groundwater

Impacts associated with dewatering excavations, such as aquifer supply loss or issues associated with the management of silt-laden construction water, would be temporary and manageable with standard safeguards. Groundwater is expected to be encountered during construction at depths greater than 1.6 m below existing ground level, with an estimated 37 ML to be dewatered.

Dewatered groundwater is likely to be sediment laden, and potentially saline, and will be managed to minimise downstream impacts. A Water Supply Work Approval (WSWA) is required for all activities that involve dewatering of groundwater (regardless of volume). The volume of dewatered groundwater would be monitored across the proposal area and a Water Access Licence (WAL) sought as volumes are expected to exceed 3 ML per water year.

The proposed work is in an area that contains terrestrial GDEs and riparian vegetation. As the proposed work only involves minor vegetation clearing (outside banks of the waterways) and dewatering of groundwater will be minimised by using trenchless techniques, the viability of these ecosystems is not considered to be at risk.



Potential operational impacts

Potential impacts to the hydrology of the study area during operation of the proposal may arise from:

- occasional discharge of wastewater during maintenance activities
- repairs to wastewater pipelines and pumping stations, which may involve excavation to access the pipeline.

Repairs to wastewater infrastructure are anticipated to occur infrequently.

Regarding impacts to overflows and water quality to Wianamatta South Creek, the network and pumping stations are designed to store a quantity of wastewater during wet weather events, preventing wastewater discharges most of the time. During extreme weather events, the wastewater storage capacity of the network and pumping station may be exceeded and untreated wastewater can flow from the overflow points, such as emergence relief structures (ERS). Wastewater system design requires overflow points as a contingency, so wastewater does not back up into houses and businesses if pipeline capacity is exceeded. This is a standard global approach to wastewater system design and Sydney Water also aligns with relevant Water Services Association of Australia (WSAA) codes and standards. During these overflow events, wastewater would have the potential to impact South Creek, potentially 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 new infrastructure has been designed for a maximum of 10 spill events in 10 years with overflow infrastructure only provided at pumping stations and not along the pipeline network. The network has been designed to be leak tight which will minimise infiltration of flood waters into the wastewater system.

All flows from the current proposal will ultimately connect to the USC AWRC and will be operated under the future scheduled activity EPL.

Mitigation measures

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

Table 6-2 Environmental mitigation measures — water and drainage

Mitigation measures

Minimise the impacts to creeks where creek crossings are required. Prior to construction the methodology will be assessed based on:

- geotechnical and constructability issues (e.g. depth of cover, potential for future scouring)
- construction footprint and duration
- ease of reinstatement
- environmental issues (flora and fauna, geomorphology, contamination, heritage, water quality and hydrology)
- any issues raised during consultation with Department of Primary Industries and Regional Development.



The decision and reasons for the decision would be documented by the Contractor in consultation with the Sydney Water Environmental Representative.

Prevent sediment moving offsite in accordance with Managing Urban Stormwater, Soils and Construction, Volume 1 and 2A (Landcom 2004 and DECC 2008), including, but not limited to:

- develop a Soil and Water Management Plan (SWMP) as part of the CEMP
- divert surface runoff away from disturbed soil and stockpiles
- install sediment and erosion controls before construction starts
- reuse topsoil where possible and stockpile separately
- inspect controls at least weekly and immediately after rainfall
- rectify damaged controls immediately
- remove controls once surfaces have been stabilised, including removing trapped sediment in drainage lines.

Stop work during heavy rainfall or in waterlogged conditions when there is a risk of sediment loss off site.

Works are to be undertaken during low flows in the waterway.



Mitigation measures

Where creek crossings are required, consider options and alternatives to minimise disturbance and impacts to the creek.

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.

Fisheries (1800 043 536) and the Environment Protection Authority (131 555) is to be notified immediately if any fish kills occur in the vicinity of the works. In such cases, all works other than emergency response procedures are to cease until the issue is rectified and approval is given by Fisheries and/or the Environment Protection authority for the works to proceed.

On completion of the works the site is to be rehabilitated and stabilised including but not limited to:

- Surplus construction materials and temporary structures (other than silt fences and other erosion and sediment control devices) installed during the course of the works are to be removed.
- Replanting the disturbed area with native endemic riparian vegetation.
- Appropriate maintenance of erosion and sediment control devices is to be undertaken until the vegetation has successfully established and the site has stabilised.

Bund potential contaminants and store on robust waterproof membrane, away from drainage lines.

Keep functioning spill kit on site for clean-up of accidental chemical/fuel spills.

Keep a functioning aquatic spill kit on site for clean-up of accidental chemical/fuel spills in mapped key fish habitat.

Keep the spill kits stocked and located for easy access.

Locate portable site amenities, chemical storage and stockpiles of erodible materials away from watercourses, drainage lines and flood prone areas. Appropriately secure/ bund temporary stockpiles or reduce/ remove stored materials on site ahead of forecasted storm/ flood events.

Groundwater volumes and pump types will be confirmed by the contractor and provided to Sydney Water. Sydney Water will obtain a groundwater Water Supply Works Approval and where dewatering is >3ML per water year (from 1 July) a Water Access Licence from NRAR will also be obtained. The Delivery Contractor is responsible for:

- providing expert hydrogeological technical information to obtain the approvals and preparing a Dewatering Management Plan
- complying with the approval conditions (such as protecting water quality; minimising aquifer extraction volumes, monitoring extraction with flow meters and recording volumes).

Discharge all water in accordance with Sydney Water's Water Quality Management During Operational Activities Policy (D0001667) including erosion controls, discharge rate, dechlorination, monitoring. Re-use potable / groundwater water where possible.

Where possible use exclusion methods to reduce groundwater ingress into open excavations.

Mitigation measures

Dewater excavations in accordance with the Delivery Management Guidance Standard 9.1 *Excavation Dewatering*.

If discharge to the environment is not possible, seek approval and discharge criteria from the relevant Sydney Water Network Area Manager prior to discharge to the wastewater system. Otherwise, tanker by a licensed waste contractor and dispose off-site to an appropriately licensed facility.

The horizontal directional drilling process would include monitoring of the pressure of the drilling fluid to determine if there is a sudden decrease in pressure which indicates that a frac-out has occurred. A CEMP would be prepared and include contingency measures to be implemented to respond to a frac-out.

Store all chemicals and fuels in accordance with relevant Australian Standards and Safety Data Sheets. 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.

Conduct refueling, fuel decanting and vehicle maintenance in compounds where possible. If field refueling is necessary, designate an area away from waterways and drainage lines with functioning spill kits close by.

Conduct any equipment wash down within a designated washout area.

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

6.2.3 Flora and fauna



Biodiversity assessment methodology

A biodiversity assessment report (BAR) was prepared by Aurecon (2024) to evaluate the potential impacts of the proposal on flora and fauna. The biodiversity assessment included a desktop review, a flora and fauna survey, likelihood of occurrence assessment for the identified flora and fauna, and Tests of Significance (ToS) for those species and communities present or likely to occur. The assessment assumes a construction corridor of 40 m for trenched sections, SPS sites per design, and 40 x 60 m for bore pits. Where feasible this width may be reduced in some areas to minimise impacts during detailed construction planning.

Findings and recommendations outlined in the BAR are summarised below and provided in full in Appendix H.

Existing environment

The area surrounding the proposal is comprised of a diversity of native and non-native vegetation zones including exotic managed grasslands, planted native and exotic vegetation, scattered paddock trees, remnant Cumberland Red Gum River-flat forest, and riparian zones with wetland vegetation along the Thompsons Creek and South Creek corridor (see Appendix H: Figure 1-1, Figure 4-4a to Figure 4-1g, and Figure 4-2 of Aurecon 2024). Native vegetation within the region



may be suitable dispersal, sheltering, foraging and breeding habitat for native species, including potential occasional and seasonal habitat for threatened species.

The wider landscape is distinguished by active construction sites with the Western Sydney international airport construction occurring south-east alongside M12 and Sydney Metro earthworks. Surrounding areas to the south and west consist of primarily residential, agricultural, and industrial land uses. The region has been subjected to varying degrees of disturbance from historic clearing and construction to agricultural and industrial uses such as landscaping and cattle farming. Due to this, there is a high coverage of weed incursion, non-native planted vegetation areas, and an abundance of common exotic grasses, forbs and shrubs.

The proposal is located within and adjacent to bushfire prone land. The contractor will review NSW rural fire service updates and follow Total Fire Ban (TOBAN) mandates.

The project area is located along Thompsons Creek and South Creek, which are mapped as Hawkesbury-Nepean KFH. The broader study area and proposal:

- is associated with aquatic, terrestrial, and subterranean groundwater dependent ecosystems
- is located within the Greater Metropolitan Region groundwater management area
- has been designed to minimise direct impact to waterways, including KFH by limited open trenching in these areas.

Water and drainage are further discussed in Section 6.2.2 of the REF.

A desktop assessment, followed by field validation was completed to identify the presence and absence of species and vegetation communities within the study area. Two threatened fauna species with a moderate or higher likelihood of occurrence were identified within the proposal's construction impact area:

- Green and Golden Bell Frog *Litoria aurea* (EPBC Act – Vulnerable, BC Act – Endangered)
- Cumberland Plain Land Snail *Meridolum corneovirens* (BC Act – Endangered) – field assessment identified signs of this species (i.e., species shell).

Prior to construction and vegetation removal commencing, preclearance surveys are recommended for these species, as per Table 6-3.

To achieve the commitments and actions in the CPCP and the requirements of the biodiversity approvals, the project must also meet the objectives listed in Section 2.3 and Section 3.3 of the CPCP Guidelines (State Government of NSW and NSW DPE, 2022). This includes ensuring the project is consistent with avoiding or minimising any adverse impacts on threatened ecological communities, threatened species and their habitats (refer to Table 5-7, Aurecon 2025 BAR); most notably koala.

The BAR notes that the assessed construction impact area is not within koala habitat mapped under the CPCP. Nor were individuals or groups of koala, eastern pygmy-possum, grey-headed flying-fox camps, or raptor (bird of prey) nests, and the threatened flora species *Pimelea spicata* observed within the assessed construction corridor impact area. To ensure consistency with CPCP requirements, however, in addition to identifying the above two species, preclearance surveys

should assess presence/absence of the following, and where necessary apply the relevant additional mitigation measures as per Table 7-1 of the BAR (Aurecon 2025).



- fauna: koala, eastern pygmy-possum, grey-headed flying-fox (including camps), raptor (bird of prey) nests
- flora: *Pimelea spicata*
- TECs: Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion (BC Act – Endangered, EPBC Act – Critically Endangered) (see, mitigation measures for indirect impacts, Table 7-1 of Aurecon 2025).

Assessments of significance under the BC Act and EPBC Act were carried out for each TEC (refer to Table 6-3 below) and threatened fauna species identified. These tests of significance found a significant impact to TECs and threatened fauna is considered unlikely due to the overall small-scale impact of the project.

Table 6-3 recommended preclearance survey locations within proposal construction corridor.

Scientific name	Common name	Associated PCTs	Key preclearance survey locations and reasoning
<i>Litoria aurea</i>	Green and Golden Bell Frog	4025,3320,3448, 4023	
<i>Meridolum comeovirens</i>	Cumberland Plain Land Snail	4025, 3320, 3448	

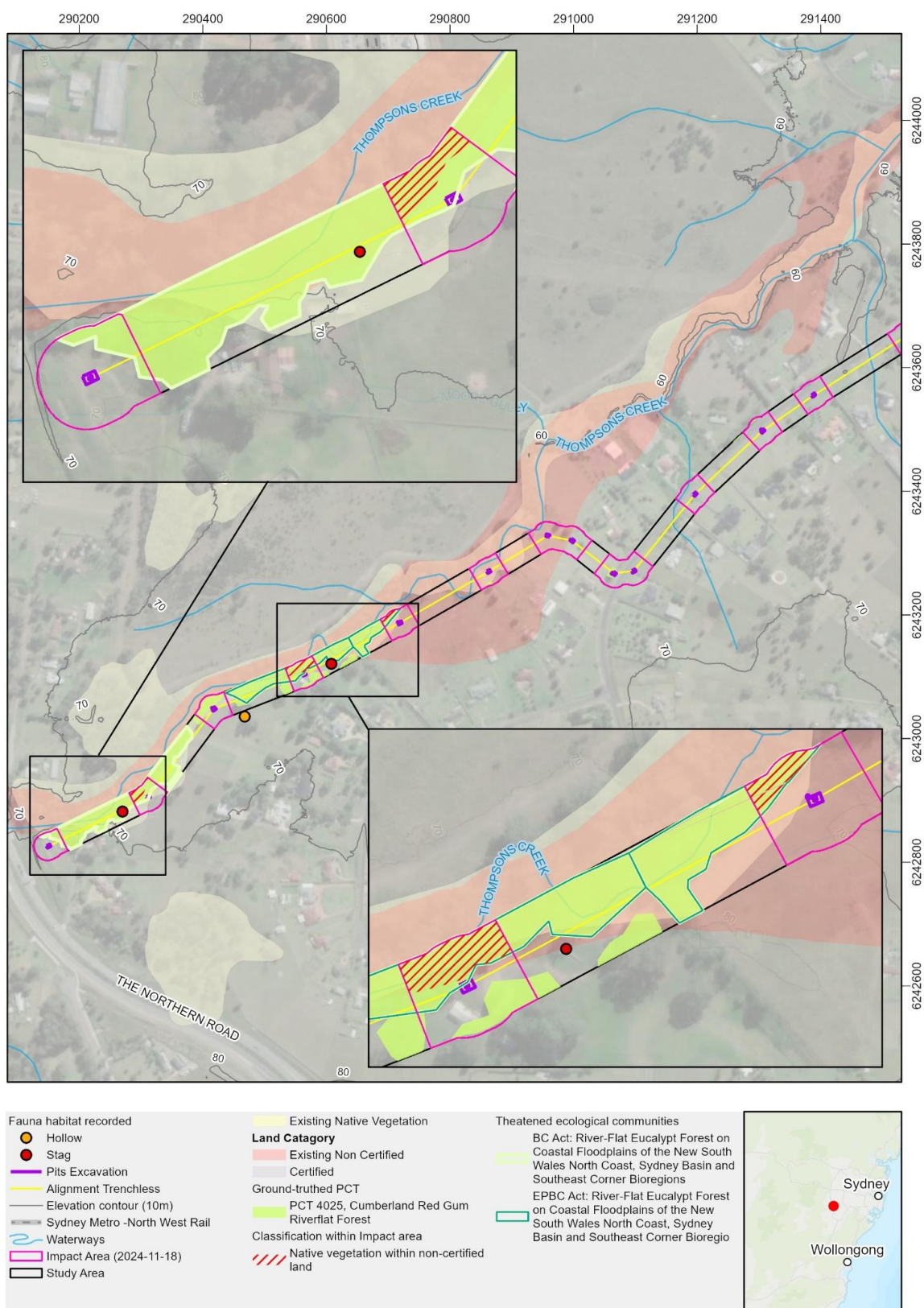
Review of the NSW state vegetation mapping indicated the potential presence of four plant community types (PCTs) with the study area, potentially analogous with five EPBC Act listed TECs and six BC Act listed TECs. Upon further assessment, field inspections observed that the vegetation within the study area varied between planted/urban exotic vegetation and native remnant vegetation corresponding with four native vegetation PCTs. Patches of PCTs within the study area were assessed as conforming to one EPBC Act, and two BC Act TECs (Table 6-4).



Native vegetation and trees present within the study area are predominantly located within Thompsons Creek riparian corridor, which is currently connected with the remaining riparian corridor of South Creek. This provides connectivity to other remaining vegetated areas along the corridor. Common bird species were seen foraging in the area during the field assessment, however, based on the condition of the vegetation present, it is not considered likely that highly mobile fauna (e.g., birds, flying mammals) would permanently inhabit the vegetation or rely on it as sole source of foraging, nesting, or roosting habitat.

Field validated vegetation

Table 6-5 provides a summary of vegetation impacts over the entire alignment, with impact areas mapped in Figures 6-1 to 6-7. In total, 2.504 ha of native vegetation will be removed, including 1.287 ha of non-threatened native vegetation, which may constitute habitat for threatened species, and 1.217 ha of TECs.



Thompsons Creek and South Creek **Biodiversity Assessment Report**

Figure 5-1a: Ecological values within the Study Area

Figure 6-1 Ecological values within project construction impact area

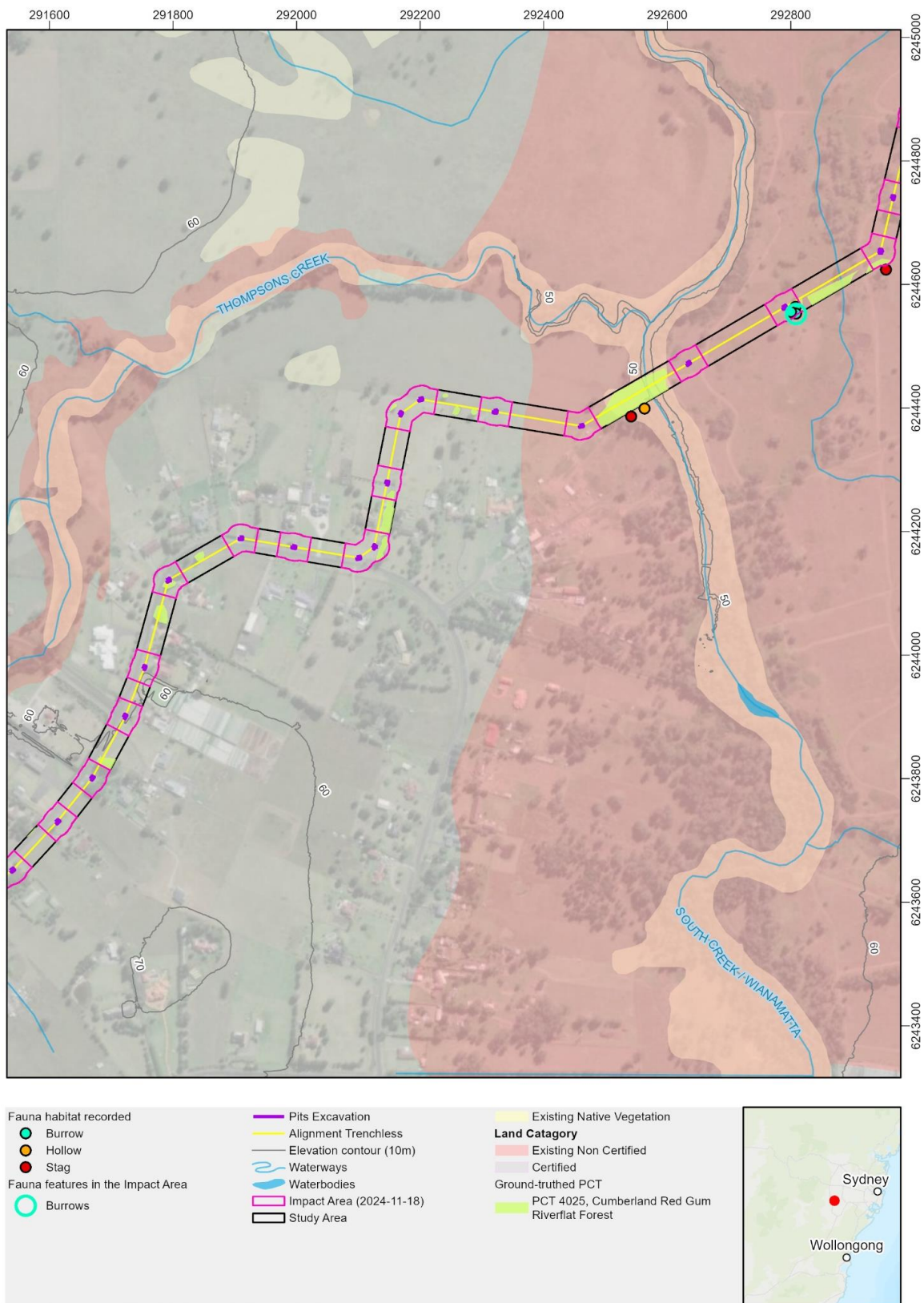


Figure 6-2 Ecological values within project construction impact area

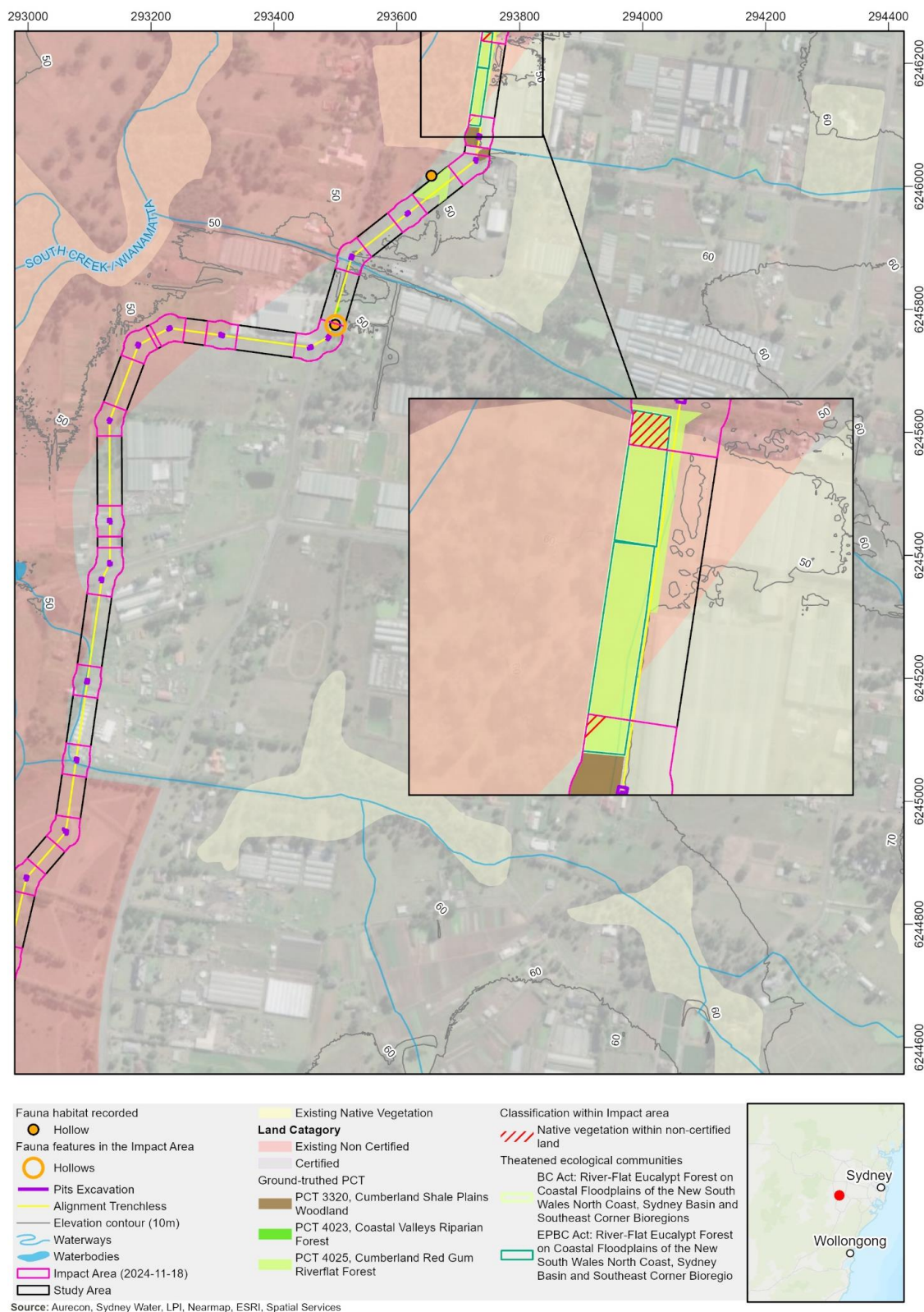
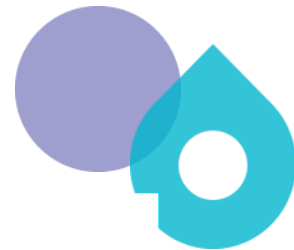
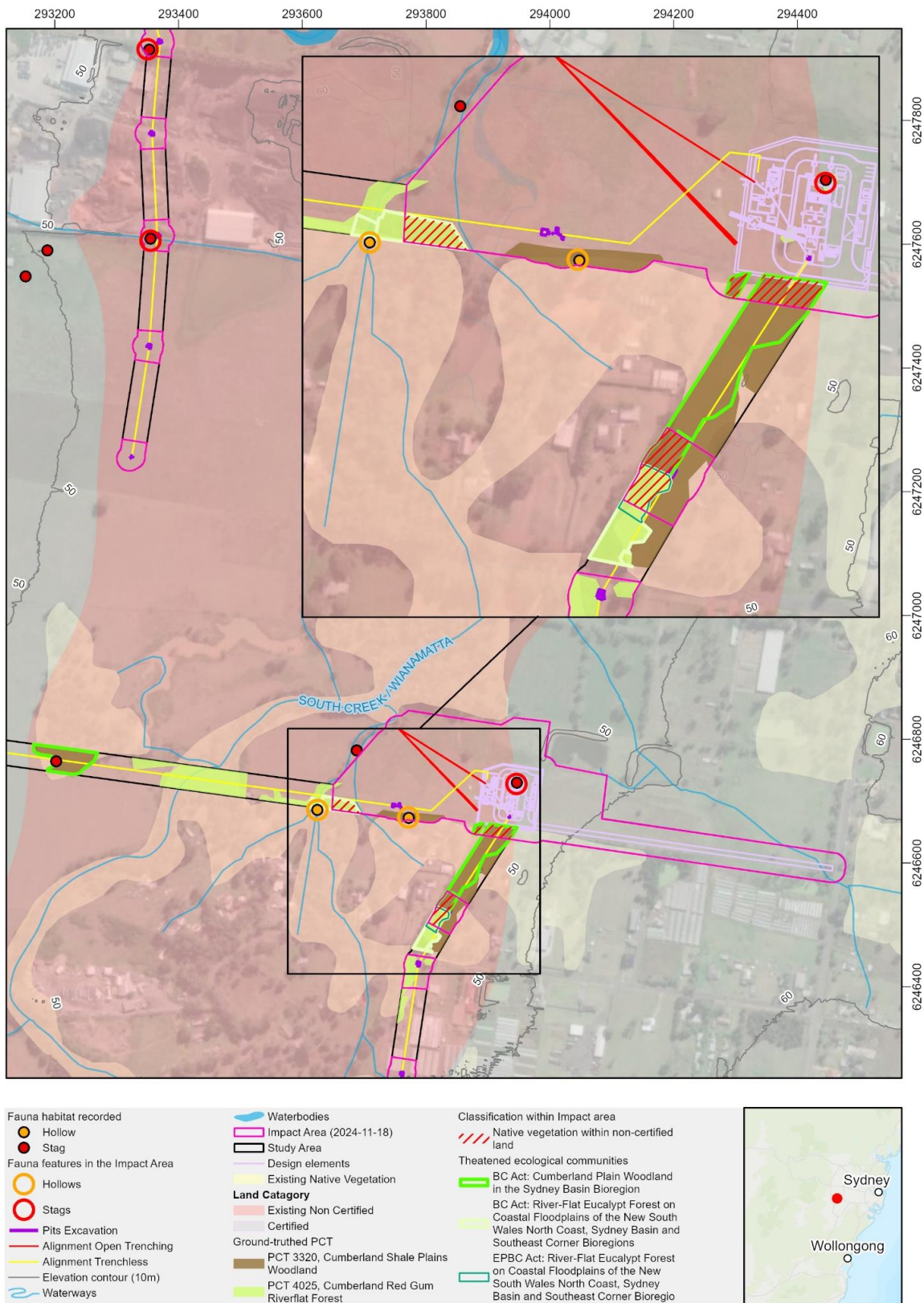


Figure 6-3 Ecological values within project construction impact area

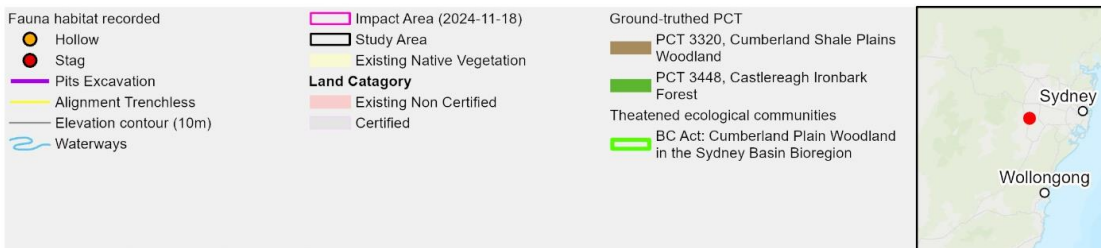
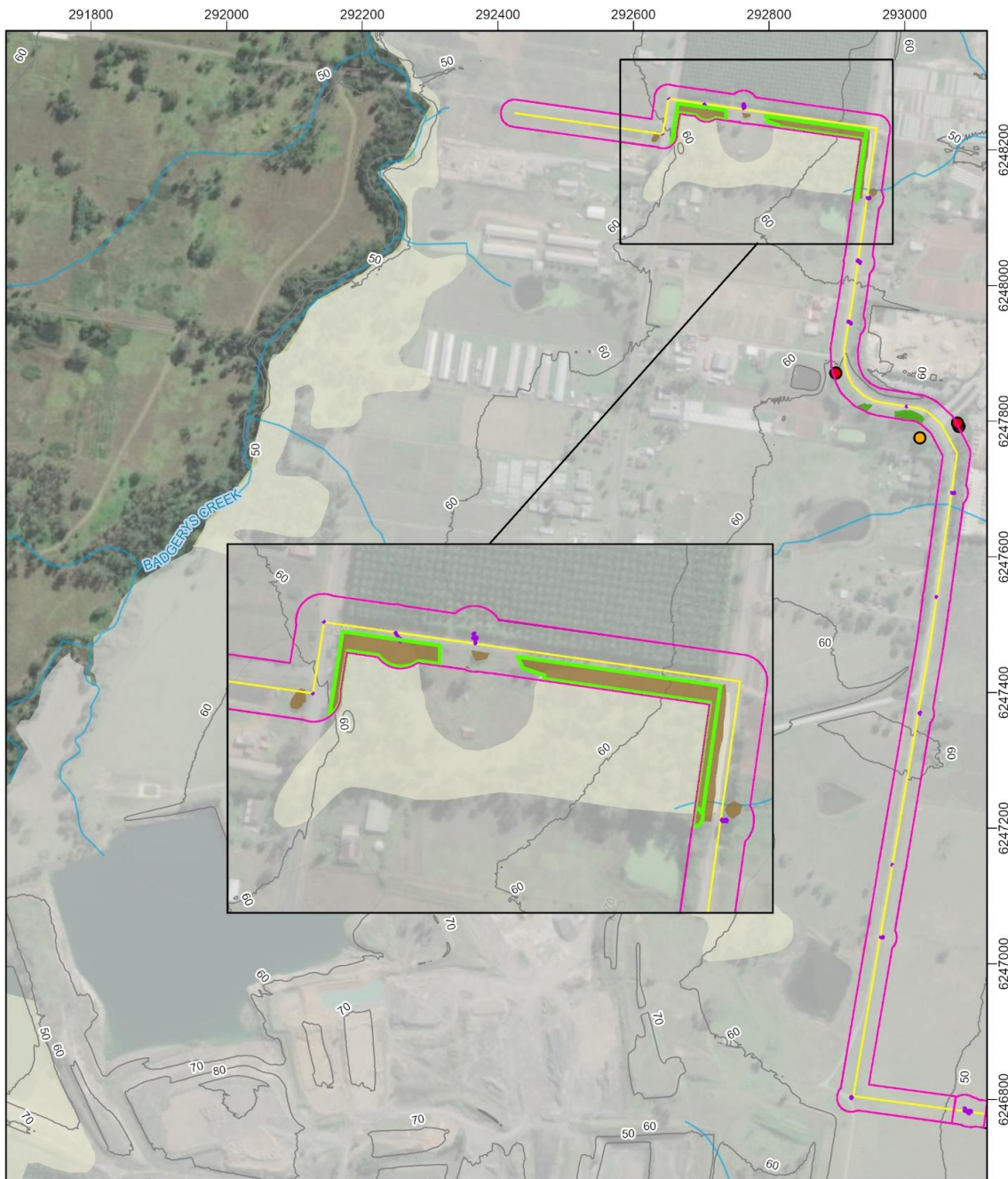




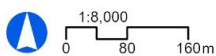
Thompsons Creek and South Creek **Biodiversity Assessment Report**

Figure 5-1d: Ecological values within the Study Area

Figure 6-4 Ecological values within project construction impact area



Source: Aurecon, Sydney Water, LPI, Nearmap, ESRI, Spatial Services

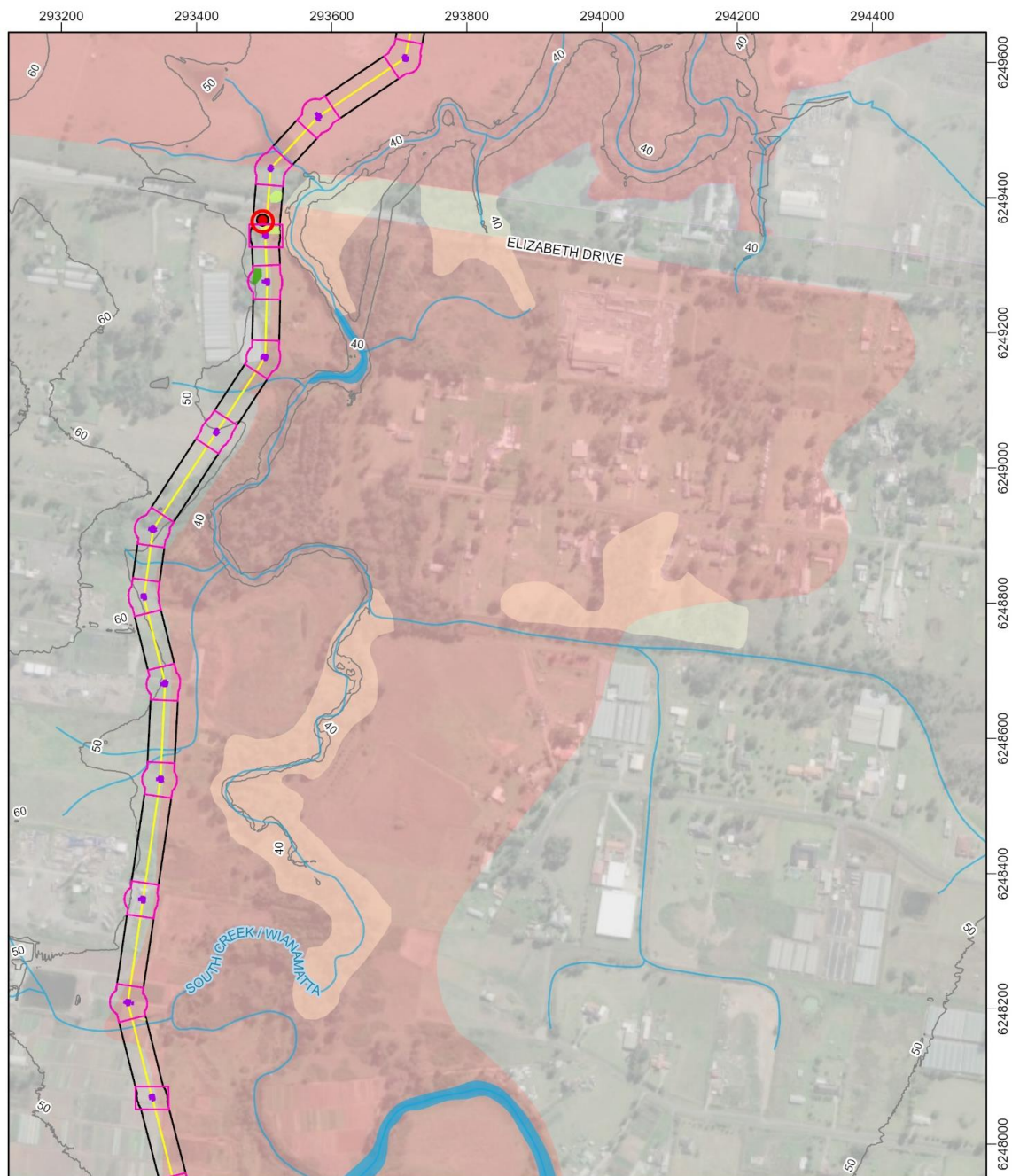


Projection: GDA2020 MGA Zone 56

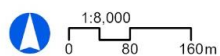
Thompsons Creek and South Creek **Biodiversity Assessment Report**

Figure 5-1e: Ecological values within the Study Area

Figure 6-5 Ecological values within project construction impact area



Source: Aurecon, Sydney Water, LPI, Nearmap, ESRI, Spatial Services



Projection: GDA2020 MGA Zone 56

Thompsons Creek and South Creek **Biodiversity Assessment Report**

Figure 5-1f: Ecological values within the Study Area

Figure 6-6 Ecological values within project construction impact area

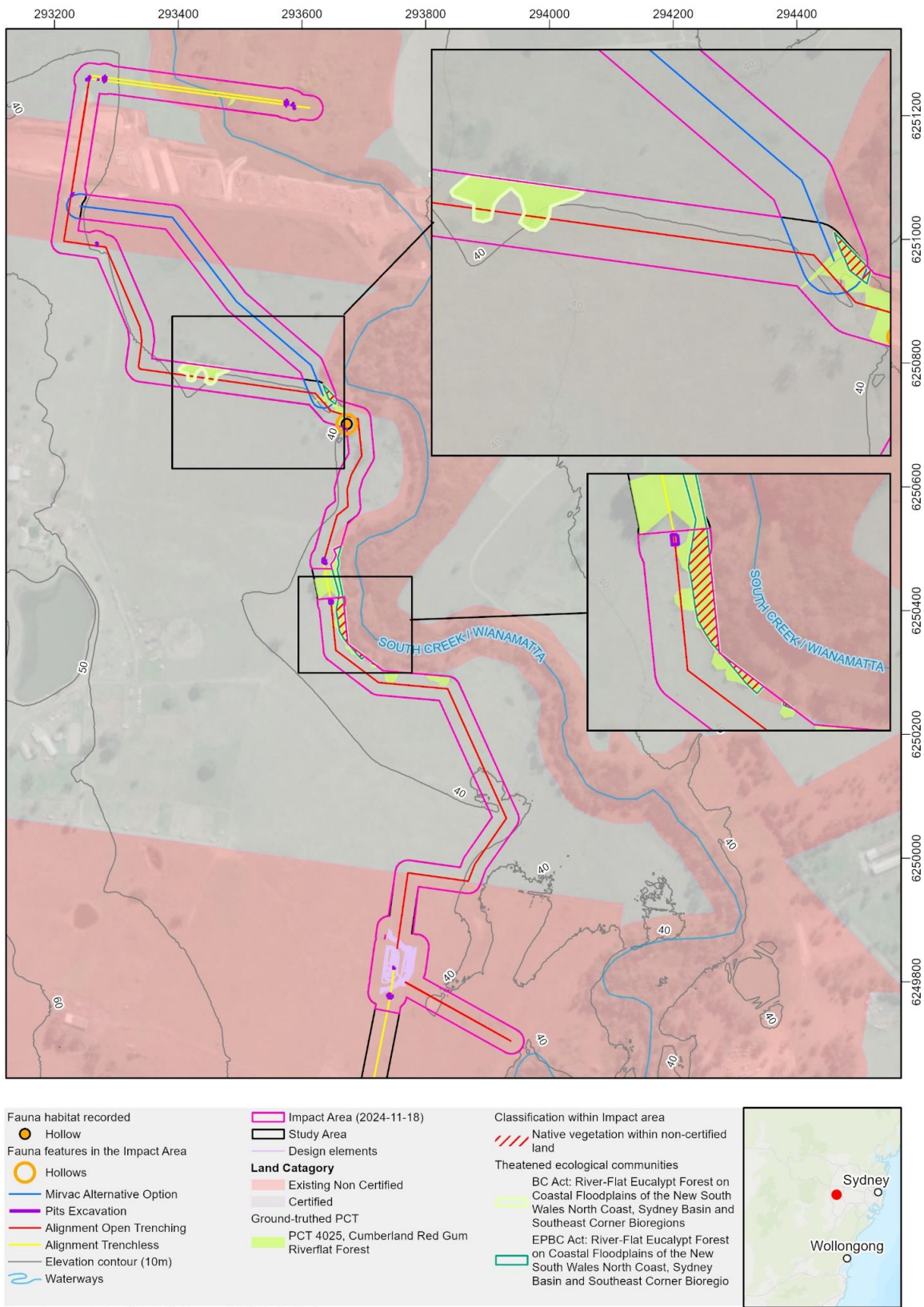


Figure 6-7 Ecological values within project construction impact area

As noted above, this assumes a construction corridor of 40 m for trenched sections, SPS sites per design, and 40 x 60 m for bore pits. Where feasible this width may be reduced in some areas to minimise impacts during detailed construction planning.

Impacts to non-TECs include:



- 0.407 ha PCT 3320: Cumberland Shale Plains Woodland
- 0.094 ha PCT 3448: Castlereagh Ironbark Forest
- 0.003 ha PCT 4023: Coastal Valleys Riparian Forest
- 0.783 ha PCT 4025: Cumberland Red Gum River-flat Forest.

Impacts to TECs include:

- 0.349 ha of EPBC Act Critically Endangered River-Flat Eucalypt Forest on Coastal Floodplains of Southern New South Wales And Eastern Victoria, **and** BC Act Endangered TEC River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions. **Of this 0.309 ha are in non-certified land.**
- 0.322 ha of **only** BC Act Endangered TEC River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions. **Of this, 0.123 ha are in non-certified land.**
- 0.546 ha of BC Act Critically Endangered TEC Cumberland Plain Woodland in the Sydney Basin Bioregion. **Of this, 0.165 ha are within non-certified land.**

Table 6-4 vegetation (field assessed) present within the proposed construction impact corridor

PCT	Potential associated BC Act TECs	Potential associated EPBC Act TECs
PCT 0 Non-native vegetation	Non-TEC.	Non-TEC.
PCT 3320: Cumberland Shale Plains Woodland	Conforms to BC Act: Cumberland Plain Woodland in the Sydney Basin Bioregion.	Does not conform to any EPBC Act TEC.
PCT 3448: Castlereagh Ironbark Forest	Does not conform to any BC Act TEC.	Does not conform to any EPBC Act TEC.
PCT 4023: Coastal Valleys Riparian Forest	Does not conform to any BC Act TEC.	Does not conform to any EPBC Act TEC.
PCT 4025: Cumberland Red Gum River-flat Forest	Conforms to BC Act: River-Flat Eucalypt Forest on Coastal Floodplains of the New South	Conforms to EPBC Act: River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria.

PCT	Potential associated BC Act TECs	Potential associated EPBC Act TECs
	Wales North Coast, Sydney Basin and Southeast Corner Bioregions.	

Several fauna habitat sites were observed within the proposal's construction impact area and may be removed if required for construction activities (refer to Appendix H, for location coordinates):

- four native canopy and stags
- four hollow baring trees, totalling 11 hollows
- three burrows.

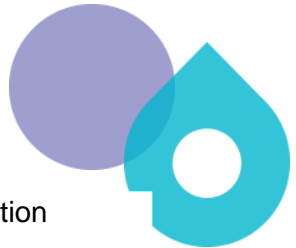

Field assessment did not identify any threatened flora within the study area. Several priority weeds were identified, including six weeds of national significance (WoNS):

- St. John's Wort (*Hypericum perforatum*)
- Blackberry *Rubus fruticosus* species aggregate (WoNS)
- Privet - broad-leaf *Ligustrum lucidum*
- Privet - narrow-leaf *Ligustrum sinense*
- Fireweed *Senecio madagascariensis* (WoNS)
- Madeira Vine *Anredera cordifolia* (WoNS)
- Common Prickly Pear *Opuntia stricta* (WoNS)
- Chilean Needlegrass *Nassella neesiana* (WoNS)
- African Boxthorn *Lycium ferocissimum* (WoNS).

The abundance of exotic species creates potential for weed species to be spread through the movement of construction vehicles and machinery, as well as the disturbance and transportation of soil in the area. Likewise, the highest risk of invasion and spread of pathogens such as Phytophthora (*Phytophthora cinnamomi*) and Myrtle Rust (*Uredo rangeli*) is via the importation of soils either on machinery or as fill. Pathogens present a greater risk for areas where clearing is to occur, as the increased stress of edge effects may make some species more susceptible to disease. Spread of weeds and pathogens, however, can be appropriately managed by apply mitigation measures outlined in Table 6-7.

Biodiversity certification orders, potential impacts and offsets

Both native and exotic vegetation is proposed to be cleared during construction. Potential impacts to flora and fauna from the proposal will primarily be due to this vegetation clearing, including the associated impacts to threatened species' habitat. The proposal, however, has been designed to reduce impacts on ecological values, and to minimise removal of native vegetation and habitat, by applying trenchless construction methods along much of the proposal. Where practicable, it is



likely that actual impacts can be minimised on-site through reductions in the construction footprint and avoiding unnecessary clearing.

Some clearing will be required on land certified under the BCO and the CPCP. These areas are identified for future development and biodiversity impacts in these areas have already been offset under the BCO and the CPCP (impacted area totaling about 1.546 ha). Our approach is to not apply the Sydney Water offset guide over the top of this, with exception of any impacts not covered by BCO or CPCP, such as offsetting the impact to hollows. Where vegetation clearing on non-certified land is proposed, further actions and offsets typically apply. Vegetation impacts assessed are summarise below and in Table 6-5. Table 6-6 outlines the offsets to be applied.

Of the total combined impacted **native vegetation** of 2.504 ha:

- 1.063 ha is in non-certified areas under the SWGA (including 0.573 ha of non-threatened vegetation, and 0.490 ha of TECs), and includes 0.489 ha of non-ENV, and **0.574 ha of ENV**. Impact to non-certified ENV requires statutory offsets in accordance with the Growth Centres BCO
- 0.133 ha is located on avoided land under the CPCP
- 0.326 ha is in certified urban capable land under the CPCP
- 0.982 ha is in certified land under the Growth Centres BCO, including 0.507 ha of non-ENV, and 0.475 ha of ENV.



For areas of the proposal that are within certified-urban capable land, consideration must be given to the mitigation requirements specified in Table 1 of the Cumberland Plain Conservation Plan Guidelines for Infrastructure Development (DPE, 2022a). The guidelines aim to ensure infrastructure development is consistent with the CPCP's commitments and actions. The mitigation requirements have been considered and those that are relevant to the proposal are incorporated into the mitigation measures (see Appendix H for details).

Of the 0.489 ha of non-certified native vegetation that is **non-ENV** (under Growth Centres BCO) and 0.133 ha of native vegetation on **avoided land** (CPCP):

- 0.299 ha comprises of TECs (offset 3:1 as per Sydney Water's offset guide)
- 0.323 ha comprises of non-threatened native vegetation or PCTs (offset 2:1 as per Sydney Water's offset guide).

There will also be 2.343 ha of HBV/ ENV to be removed, which overlaps with the above calculations. This will be notified as per section 4.25A of the *State Environmental Planning Policy (Precincts— Western Parkland City) 2021*.

During the proposal's options design phase, an alternative option through developer land was considered. If selected as a preferred option during detailed design, this alignment would not impact any native vegetation but would impact non-native vegetation which is mapped as 0.489 ha of HBV/ ENV (refer to Appendix H, Table 4-10 of Aurecon 2024). This would require notification as per section 4.25A of the *State Environmental Planning Policy (Precincts— Western Parkland City) 2021*.



Additional proposed vegetation impacts include about 41.485 ha of non-native (PCT 0) vegetation within certified (27.181 ha) and non-certified (14.304 ha) land areas. No further actions or offsets are required for removal of non-native vegetation (refer to Appendix H, Table 4-10 of Aurecon 2024).

Table 6-5 Summary of impacts to PCTs and TECs on certified and non-certified.

Ground truthed native vegetation: Plant community type (PCT); Threatened Ecological Communities (TECs).		Total within Impact Area	Total impacted area within <u>certified</u> <u>land</u> areas			Total impacted area within <u>non-certified</u> areas		
			CPCP	SWGA		CPCP	SWGA	
			Certified urban capable land	ENV	Non-ENV	Avoided land	ENV	Non-ENV
Non-threatened PCT	Cumberland Shale Plains Woodland	0.407	0.000	0.127	0.051	0.000	0.151	0.078
	Castlereagh Ironbark Forest	0.094	0.000	0.000	0.094	0.000	0.000	0.000
	Coastal Valleys Riparian Forest	0.003	0.000	0.000	0.003	0.000	0.000	0.000
	Cumberland Red Gum River-flat Forest	0.783	0.206	0.032	0.175	0.026	0.125	0.219
PCT Sub-total		1.287	0.206	0.159	0.323	0.026	0.276	0.297
TECs	EPBC Act <u>and</u> BC Act: River-Flat Eucalypt Forest on Coastal Floodplains	0.349	0.000	0.024	0.016	0.107	0.133	0.069
	<u>Only</u> BC Act: River-Flat Eucalypt Forest on Coastal Floodplains	0.322	0.120	0.040	0.039	0.000	0.055	0.068
	BC Act: Cumberland Plain Woodland in the Sydney Basin Bioregion	0.546	0.000	0.252	0.129	0.000	0.110	0.055
TEC Sub-total		1.217	0.120	0.316	0.184	0.107	0.298	0.192
Combined (PCT and TEC) total		2.504	0.326	0.475	0.507	0.133**	0.574*	0.489**

*Statutory offsets required under the Growth Centre BCOs (3:1)

**voluntary offsets implemented under Sydney Water's Biodiversity Offset Guideline (3:1 for TECs and 2:1 for PCTs)

Note: There will also be up to 2.343 ha (preferred option) and 0.489 ha (Mirvac alternative) of HBV/ ENV to be removed, which overlaps with the above calculations. Impact to HBV-ENV would require notification as per section 4.25A of the *State Environmental Planning Policy (Precincts— Western Parkland City) 2021*.

Table 6-6 Project offset requirements (refer to footnotes and Appendix H for further details)

Offset ration requirements	Total impacted area (ha) within <u>non-certified</u> land		
	CPCP	SWGA	
	Avoided land	ENV	Non-ENV
Proposal impact (ha)			
PCT Sub-total	0.026	0.276	0.297
TEC Sub-total	0.107	0.298	0.192
Combined (PCT and TEC) total	0.133**	0.574*	0.489**
Required offsets (ha)			
PCT Sub-total	0.052	0.828	0.594
TEC Sub-total	0.214	0.894	0.384
Combined (PCT and TEC) total	0.266	1.722	0.978

*Statutory offsets required under the Growth Centre BCOs (3:1)

**voluntary offsets implemented under Sydney Water's Biodiversity Offset Guideline (3:1 for TECs and 2:1 for PCTs)

Note: where removal is unavoidable, hollows will be offset 2:1, as per Sydney Water's Biodiversity Offset Guideline (22 hollows or 11 salvaged hollows)

Operational impacts

No direct operational impacts are anticipated on vegetation communities, flora or fauna. Indirect operational impacts to biodiversity may result from noise disturbance and infrequent wastewater discharge. Bushfire risk is considered low as the above ground infrastructure (i.e., the pumping stations) are clear of surrounding vegetation.

Mitigation measures

With the implementation of the mitigation measures below, impacts to ecology can be adequately managed, and residual impacts are expected to be low.

Table 6-7 Environmental mitigation measures — flora and fauna

SW standard mitigation measures for flora and fauna

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:

SW standard mitigation measures for flora and fauna

- 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, in a declared area of outstanding biodiversity value, in areas mapped as ENV or RBM 12 under the Sydney Growth Centre Biodiversity Certification Order or in land mapped as avoided land or strategic conservation area under the Cumberland Plain Conservation Plan.

- Any removal of remnant vegetation where there is no net change to environmental impact (e.g. a different area of vegetation is removed but the total area is the same or less than assessed in the EIA).

Written explanation of the application of this clause (including justification of the need for trimming or removal and any proposed revegetation) should be provided when seeking Project Manager approval. Any impacts to native vegetation and trees in non-certified land (with the exception of ENV) must be offset in accordance with the Biodiversity Offset Guideline ([SWEMS0019.13](#)).

Map and report native vegetation clearing greater than 0.01 ha in extent (and any associated rehabilitation) to the Sydney Water Environmental Representative. Track vegetation clearing as per [SWEMS0015.26](#) Contractor Native Vegetation Clearing and Rehabilitation template.

Minimise vegetation clearance and disturbance, including impacts to standing dead trees and riparian zones. Where possible, limit clearing to trimming rather than the removal of whole plants.

Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing.

- Any native vegetation to be cleared within the Impact Area will be clearly identified and marked.
- Native vegetation to remain will be clearly delineated as No-Go-Zones to avoid risk of clearing. Clearing and No-Go-Zone maps to be prepared and approved by SWC prior to works commencing. Signing stating No-Go-Zone to be placed in fences. All staff will be made aware of No-Go-Zones during induction and be provided with a map of No-Go-Zones.
- Tree removal is to be confirmed by an arborist due to potential to retain these trees if impact to the Tree Protection Zone is minimal. Tree Protection Zone details are provided within the *Australian Standard 4970-2009 Protection of trees on development sites*.

Adjust methodology (e.g. avoid area, hand excavate, implement exclusion fencing) to protect sensitive areas where possible (such as mature trees, known threatened species, populations or ecological communities).

Protect trees in accordance with the requirements of Australian Standard 4970-2009 for the Protection of Trees on Development Sites. Do not damage tree roots unless absolutely necessary and engage a qualified arborist where roots >50mm are impacted within the Tree Protection Zone.

SW standard mitigation measures for flora and fauna

Potentially affected residents will be notified of any tree removal.

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. If native fauna is likely to be present, a licensed ecologist should inspect the removal and undertake fauna relocation.

Inspect vegetation for potential fauna prior to clearing or trimming. If fauna is present, or ecological assessment has determined high likelihood of native fauna presence, including removal of hollow bearing trees, engage a licensed ecologist to inspect and relocate fauna before works.

If native fauna is encountered on site, stop work and allow the fauna to move away unharassed. Engage a licensed ecologist if assistance is required to move fauna.

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

Manage biosecurity in accordance with:

- *Biosecurity Act 2015* (see NSW Weedwise), including reporting new weed infestations or invasive pests
- contemporary bush regeneration practices, including disposal of sealed bagged weeds to a licensed waste disposal facility
- taking into account relevant guidance in the CPCP's Weed Control Implementation Strategy.

Record Pesticides and Herbicides use in accordance with SWEMS00017.

If replanting near Sydney Water pipelines refer to '*Which trees can damage wastewater pipes?*' link from [Sydney Water website](#).

In TOBAN

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

Staff and contractors must not contact local RFS directly to seek their own exemption.

Contractor to monitor and record area of ENV cleared and provide to Sydney Water in accordance with [SWEMS0015.26](#).

Minimise impacts on native vegetation in non-certified areas, native vegetation retention areas and areas outside the growth centre. Options to consider where feasible include:

- alternative construction methodologies (under bore vegetation and waterways, compressed construction corridors)

SW standard mitigation measures for flora and fauna

- avoiding impact to hollow bearing and habitat trees.

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.

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

Any mitigation measures received from DPHI in response to statement to demonstrate consistency with Section 2.3 of the CPCP Infrastructure Guidelines should be included in the CEMP.

Consult Taronga Zoo's Ben Zerbis [REDACTED] prior to the removal of vegetation to determine the usefulness of vegetation waste as koala feed.

Preclearance surveys recommended for:

- Green and Golden Bell Frog and the Cumberland Plain Land Snail.

Fauna spotter catcher required to be present during all construction works to avoid potential direct impacts to native species including threatened Cumberland Plain Land Snail.

To ensure consistency with CPCP requirements, preclearance surveys should assess presence/absence of the following:

- fauna: koala, eastern pygmy-possum, grey-headed flying-fox (including camps), raptor (bird of prey) nests
- flora: *Pimelea spicata*
- TECs: Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion (BC Act – Endangered, EPBC Act – Critically Endangered) (see, mitigation measures for indirect impacts, Table 7-1 of Aurecon 2025).

If present apply the relevant additional mitigation measures as per Table 7-1 of the BAR (Aurecon 2025).

6.2.4 Heritage

Aboriginal heritage

An Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared by Kelleher Nightingale. The full report is provided as Appendix I and has been summarised below. The assessment for the ACHAR included an initial Aboriginal heritage due diligence (AHDD), database searches for Aboriginal heritage sites, a desktop assessment and field inspection. The ACHAR will support an application for an AHIP under section 90 of the *National Parks and Wildlife Act 1974* (Figure 6-8).



Existing environment and potential impacts

A search of the Aboriginal heritage information management system (AHIMS) and review of prior Aboriginal heritage studies identified several Aboriginal heritage sites in the region. The identified sites were a combination of artefacts and potential archaeological deposits (PADs).

A field survey was carried out to expand on the findings of the desktop assessment, and an archaeological test excavation program was undertaken within a 50 m wide study area corridor in June 2024. Generally, the survey found that much of the study area displayed, little to no potential for intact subsurface archaeology, due to high levels of ground surface disturbance and modification and through impacts from natural processes such as erosion and flooding.

Aboriginal archaeological assessment identified 13 Aboriginal archaeological sites (comprising 14 AHIMS registrations) within the study area. Subsequent impact assessment confirmed that nine Aboriginal archaeological sites (comprising ten AHIMS registrations) are located within the impact area for the project (Figure 6-9, Figure 6-10, Table 6-8).

Conservation is the primary goal of all Aboriginal heritage management. Where conservation cannot be maintained, the consequence of harm includes total and partial loss, with the significance of harm ranging from low to moderate-high (Table 6-8). Depending on the existing archaeological value and proposed impact, salvage excavation and/or surface collection is recommended as part of the mitigation measures. The archaeological value of the sites is linked to the information that they contain. Recovery of this information through archaeological salvage excavation would help to mitigate the impact of the proposal and offer an opportunity to better understand the activities which were undertaken at these sites. As well as the effect of land use disturbance and natural processes on subsurface archaeological deposits in the vicinity of South Creek. All archaeological excavation that is required, will be restricted to the actual construction corridor and approved AHIP area, with all other areas appropriately demarcated and protected as no-go zones that will be identified in the CEMP. Salvage excavation is recommended to be undertaken at sites of moderate-high archaeological significance within the impact area. No archaeological salvage mitigation is warranted for low significance sites located within the impact area.

Under section 90 of the *National Parks and Wildlife Act 1974*, impact to these sites requires a land based AHIP for the project, for all areas not already covered under an existing approval/AHIP. Accordingly, an AHIP is being sought for Aboriginal objects within the boundaries of the impact area, incorporating the archaeological sites listed in Table 6-8.

The proposal area overlaps several areas that have been previously assessed for Aboriginal cultural heritage values and are covered under the existing AHIPs and State Significant Infrastructure (SSI) approval (Table 6-9). These approvals/AHIPs are active/current where they intersect the current proposed works, and include conditions related to Aboriginal heritage considerations within their boundaries. Before commencing work, Sydney Water will seek AHIP holder agreement to perform our activities under their AHIP.

Table 6-8 Summary of archaeological sites along the proposed construction corridor

ID	AHIMS	Site feature	Archaeological significance	Construction impact	Consequence of harm and significance	Mitigation
South Creek West T1 (SCW T1)	45-5-5307	Artefact scatter	Moderate-high	Direct / Partial	Partial loss of value; Moderate-high	Salvage excavation Surface collection
South Creek West T2 (SCW T2)	45-5-5308	Artefact scatter	Moderate-high	Direct / Partial	Partial loss of value; Moderate-high	Salvage excavation Surface collection
South Creek	45-5-0215	Grinding Groove	High	No impact	None	N/A
South Creek, Exeter House TRE 1	45-5-5878	Culturally modified (scarred) tree	High	No impact	None	N/A
Elizabeth Precinct Isolated Find 06 (EP IF 06)	45-5-5659	Isolated artefact	Low	Direct / Total	Total loss of value; Low	Surface collection
Elizabeth Drive AFT 1 (includes Elizabeth Precinct PAD 03)	45-5-5259 (includes 45-5-5234)	Artefact scatter	Moderate	Direct / Partial	Partial loss of value; Moderate	Salvage excavation Surface collection
30-40 Martin Road Artefact Scatter 01	45-5-5663	Artefact scatter	Low	Direct / Partial	Partial loss of value; Low	Surface collection
BCBW18 AS 02	45-5-5164	Artefact scatter	Low	Direct / Partial	Partial loss of value; Low	Surface collection
Western Road AFT 1	tbc	Artefact scatter	Moderate	Direct / Partial	Total loss of value; Moderate	Salvage excavation

ID	AHIMS	Site feature	Archaeological significance	Construction impact	Consequence of harm and significance	Mitigation
						Surface collection
Rossmore Grange	45-5-5842	PAD	Moderate	Direct / Partial	Partial loss of value; Low	Surface collection
Rossmore Grange AFT 1	tbc	Artefact scatter	Moderate	Direct / Partial	Partial loss of value; Moderate	Salvage excavation Surface collection
Medich Place AFT 1	tbc	Artefact scatter	Low	Direct / Total	Total loss of value; Low	Surface collection
Medich Place AFT 2	tbc	Artefact scatter	Low	Direct / Total	Total loss of value; Low	Surface collection

Table 6-9 Existing AHIP/SSI areas that overlap the proposal area

Permits/ Approval	Project	End date	Areas of proposal affected	AHIP/Approval owner
SSI 9364	M12 Motorway	N/A	Construction corridor of SCPM01 intercepts existing approval near M12 Motorway and Fleurs Radio Telescope Site.	TfNSW
SSI 8609189	AWRC	N/A	Construction corridor of SCPM01 (north of M12 Motorway), SP1243 overflow, and Elizabeth Drive crossing in existing AWRC approval	Sydney Water Corporation
AHIP C00005620	Prospect South to Macarthur Drinking Water Link	02/03/2024	Construction corridor intercepts existing AHIP between Western Road, Watts Road, and Ramsay Road.	Sydney Water Corporation
AHIP C0002788	The Northern Road Upgrade (TNR2A, TNR2B, TNR2C)	18/07/2027	Southern end of TCGC02 construction corridor intercepts existing AHIP.	TfNSW

This information has been redacted to protect sensitive Aboriginal heritage information



Figure 6-8 AHIP application area (KNC 2024).

This information has been redacted to protect sensitive Aboriginal heritage information

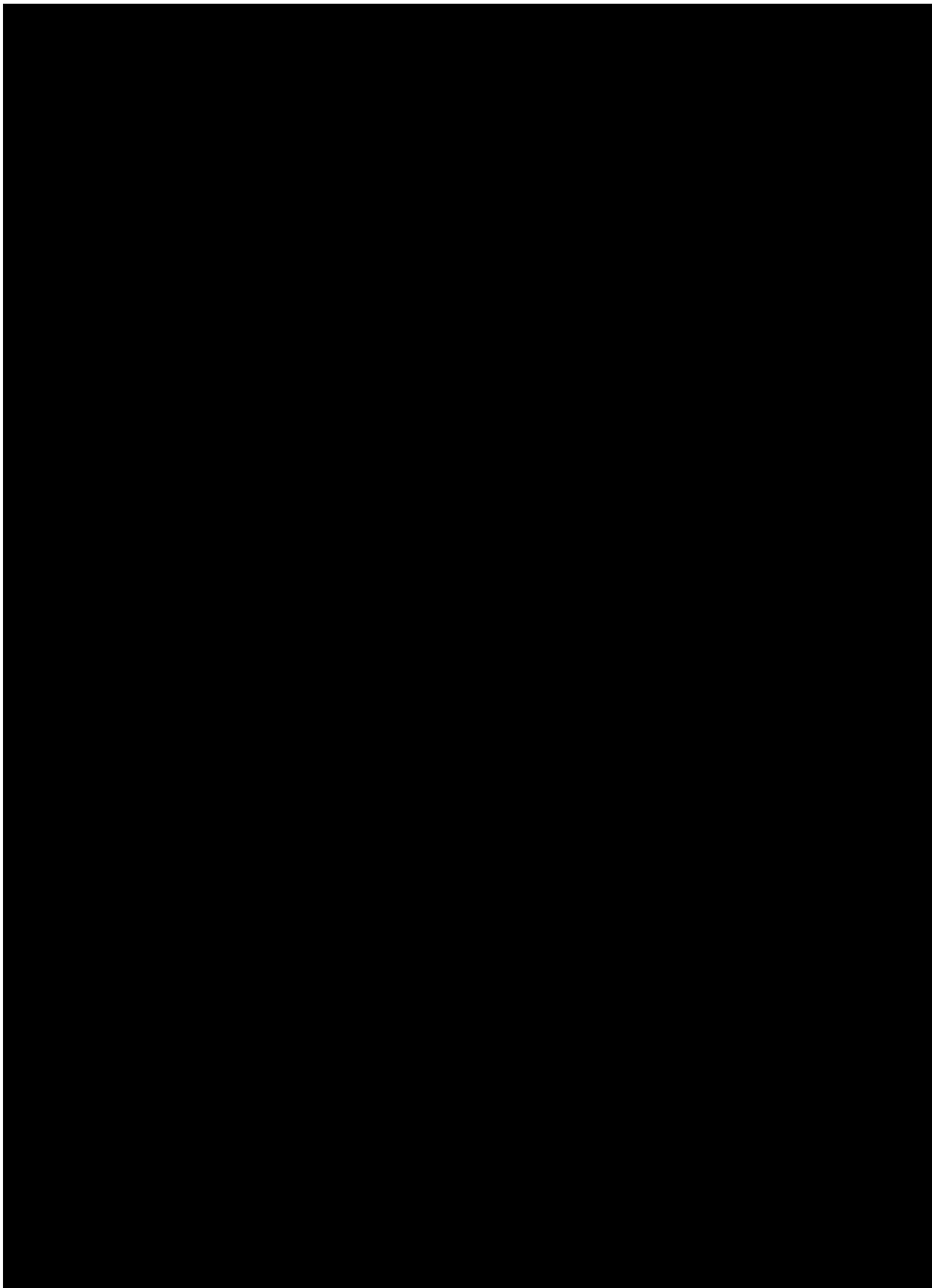


Figure 6-9 Proposed impacts to Aboriginal heritage (KNC 2024).

This information has been redacted to protect sensitive Aboriginal heritage information



Figure 6-10 Proposed impacts to Aboriginal heritage (KNC 2024).



Non-Aboriginal heritage

There are very few listed non-Aboriginal heritage items in the vicinity of the proposal, with sites summarised below.

- The Fleurs Radio Telescope Site
 - State Environmental Planning Policy (Precincts – Western Parkland City) 2021, Schedule 2 – I5, Local significance
 - Penrith LEP 2010, Item 832, Local significance (*expired listing*)
- Fleurs Aerodrome, item of potential (Local) heritage significance.

The Fleurs Radio Telescope Site (I5)



The Fleurs Radio Telescope Site is in Kemps Creek, in the Penrith LGA, about two (2) kilometers north from Elizabeth Drive. The area is bisected by South Creek which meanders through the landscape on a north-south axis, dividing the area into an eastern and western portion. Several large construction projects, including the Sydney Water Upper South Creek Advance Water Recycling Centre (USC AWRC) and M12 Motorway, wholly or partially fall within the heritage curtilage of the site. These projects have greatly changed the landscape within the heritage curtilage (Extent Heritage, 2021; Jacobs, 2019).

The current proposal, in particular alignment SCPM01, falls within the curtilage of the Fleurs Radio Telescope Site (refer above to Figure 3-4). The northern extent of SCPM01 is proposed to extend east towards the USC AWRC site, crossing beneath South Creek via trenchless methods of construction. Construction of the USC AWRC is currently underway and has caused changes to the site, including removal of many of the above ground features that added much value to the heritage listing of the Fleurs Radio Telescope Site (CRM, 2019; Extent Heritage, 2021).

Site significance

The site significance was assessed in consultation with Sydney Water's Senior Heritage Advisor, and detailed in Appendix F. In summary, the landscape of Fleurs Radio Telescope Site has endured several programs of removal and demolition throughout the 1990s and early 2000s, and the existing landscape is highly fragmented with little integrity for the original site configuration particularly due to recent construction of the USC AWRC (Extent Heritage, 2021; CRM, 2019). The value of the site, therefore, is predominantly connected to past use and function, including early pastoral use and for its role in the development and innovation of radio astronomy in Australia, and not the limited remaining physical fabric of the place.

In 2019, the University of Sydney (owners of the Fleurs Radio Telescope Site) commissioned Cultural Resources Management (CRM) to complete a heritage assessment to identify the cultural resources that remain within the site and determine the heritage significance of the site (CRM, 2019). This included completion of a site survey to identify and map areas of high archaeological potential, including physical remnants scattered throughout the site (Appendix G). In a later report, it was found that '*...the archaeological resource associated with Fleurs Radio Telescope Site is unlikely to meet the threshold for local significance*' (Extent Heritage, 2021, Section 5.4), and the extensive remnants identified on site were found to have "*...limited potential to provide new insight*



into the operations of the telescope installations, particularly as they are highly truncated and fragmentary...[and] they would also be considered 'works', as defined by the Heritage Act, and not afforded protection under the 'relics provision' of the Heritage Act" (Extent Heritage, 2021, p. 95).

Construction and operational impacts

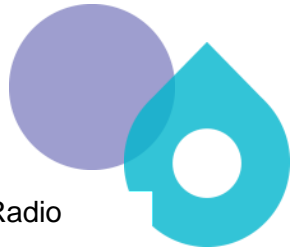

The current proposal falls within the curtilage of heritage item I5 Fleurs Radio Telescope Site (local significance), and survey areas 7 and 9 as defined in the 2019 CRM study (Table 6-10). The proposed construction activities within the Fleurs Radio Telescope Site will be at a localised scale and low intensity and would not adversely affect the significance of the heritage item. The proposed alignment has been designed to minimise ground disturbance, including impact to known heritage features identified by CRM (2019) (refer to Figure 3-4), through less destructive construction methods (trenchless technology). Similarly, site access will be designed to avoid known heritage features (Figure 6-11).

Construction activities closest to items with known or potential heritage value as identified by CRM (2019), include:

- HDD, including the excavation for entry and exit pits (permitted under Exception 11)
- setup and laydown of equipment compounds, with the exact location to be selected during detailed design and positioned away from known heritage features
- site traversal (vehicles and equipment, and personnel), to be confirmed and designed to avoid known heritage features.

The potential for proposed construction activities to impact the heritage significance and values of the Fleurs Radio Telescope Site, or unknown relics is expected to be minor when considering:

- recent impacts to the broader site from ongoing construction within the region (eg USC AWRC and M12 Motorway developments), which have removed many key heritage values/features of the site
- the preferred proposed construction method being HDD – minimising aboveground surface disturbance by reducing the area of open trenching required
- the small footprint of the proposed construction, relative to the area of the site
- prior assessment that *'...the archaeological resource associated with Fleurs Radio Telescope Site is unlikely to meet the threshold for local significance'* (Extent Heritage, 2021, Section 5.4)
- prior assessment that the remaining fragments and remnants of unknown structures above and beneath the ground *"...would also be considered 'works', as defined by the Heritage Act"* (Extent Heritage, 2021, p. 95)
- the implementation of the mitigation measures proposed below, including no-go zones where areas of known high potential heritage value are located and inclusion of an unexpected finds protocol.



The potential for the assets to impact the heritage significance and values of Fleurs Radio Telescope Site during operation is expected to be inconsequential when considering:

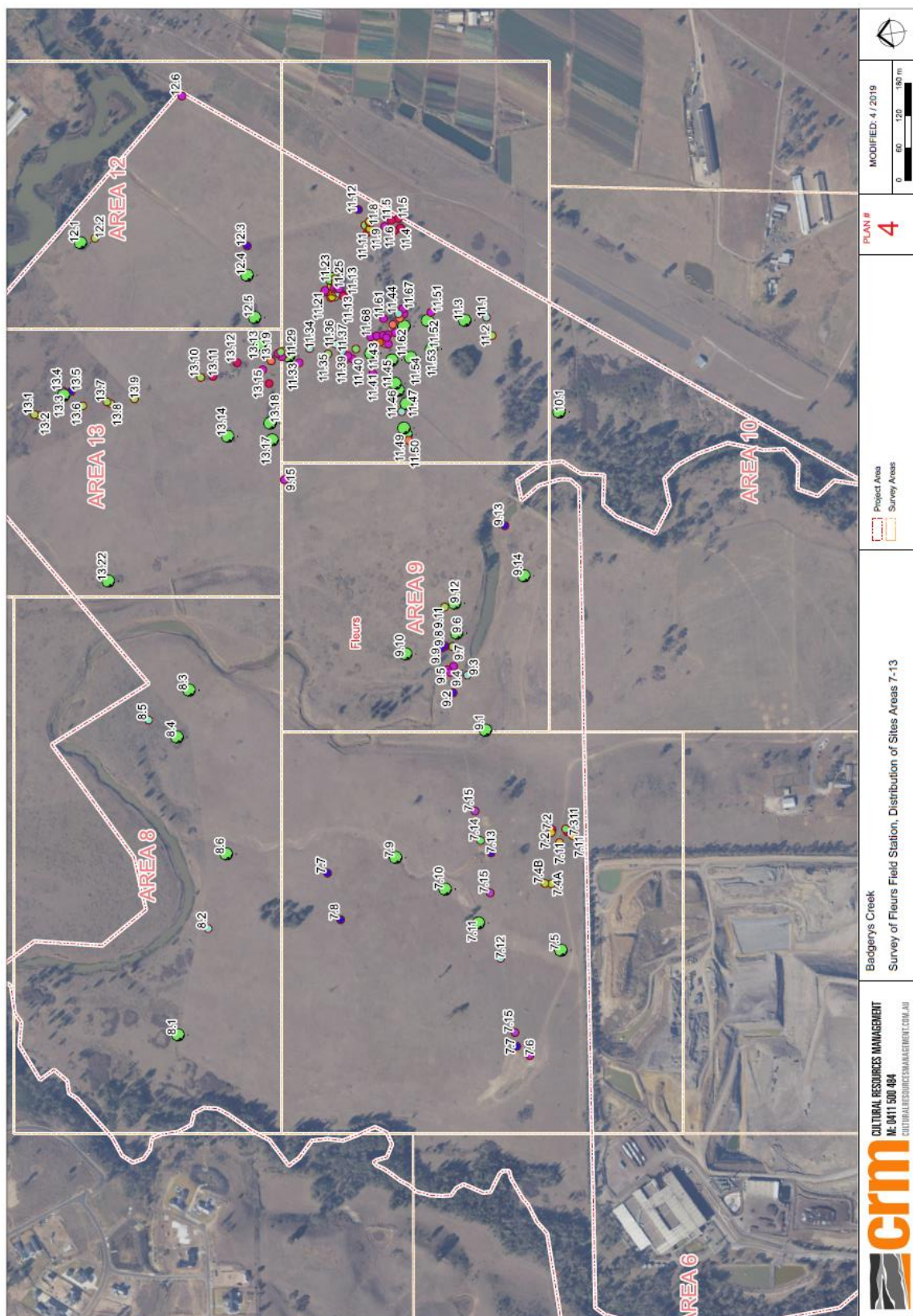
- pipeline is designed to be below ground during operation
- site is to be returned to pre-existing conditions post construction work, including areas where ground disturbance is required for drilling work. Therefore, the proposal's potential impact to the aesthetic values associated with the existing open rural landscape will be temporary.

The current proposal will avoid impacts to surveyed archaeological points of this potential heritage item using a 5 m buffer no-go zones shown in Figure 3-4 (refer above to Section 3). The potential impact of the proposal on this item of potential heritage significance is therefore considered negligible. There would be no impact to non-Aboriginal heritage during operation.

Table 6-10 Fleurs Radio Telescope site survey descriptions taken from CRM 2019 heritage assessment report.

Area	Description
07	Has evidence that may define a nineteenth century area of occupation including one or two building sites and artefact scatters. There are several areas of brambles that may identify earlier areas of activity of any date. There are four sites that relate to the use of the site for the radio telescope array. There is also evidence of a program of demolition and clearance that occurred in 2005.
09	This area also encompassed substantial areas of brambles some in association with evidence from the radio physics improvements. The latter includes what may have been two signal boxes connected to an antenna, one of the parabolic antenna now fallen, some unidentified foundations near the creek, services and cables that emerge from underground trenching and a timber pole that may have brought electricity to the array. There is also evidence of two timber bridges that crossed South Creek at different places; now collapsed it is impossible to accurately date them.

CRM 2019 University of Sydney Western Sydney Lands: Badgerys Creek Farm Centre, Elizabeth Drive, Badgerys Creek. Heritage Assessment



The Fleurs Aerodrome

The Fleurs Aerodrome is a small airfield with one 25 m wide, relatively short (about 300 m) runway adjoining the eastern boundary of the Fleurs Radio Telescope Site, with the remaining sections of the airfield grassed. It was identified during the USC AWRC EIS (Sydney Water 2021) as a potential non-Aboriginal heritage item. It is not listed on any statutory heritage list but was considered to have potential heritage significance. The current proposal is not within the curtilage of this potential heritage item. The potential impact of the proposal on this item of potential heritage significance is therefore considered negligible.

There would be no impact to non-Aboriginal heritage during operation.

Mitigation measures

With the implementation of the mitigation measures below, impacts to heritage can be adequately managed, and residual impacts are expected to be low.

Table 6-11 Environmental mitigation measures — heritage

Mitigation measures
Do not make publicly available or publish, in any form, Aboriginal heritage information on sites / potential archaeological deposits, particularly regarding location.
Repeat the basic AHIMS search if it is older than 12 months. Conduct additional assessment if new sites are registered and could be impacted by the works outside the AHIP footprint.
Harm to any Aboriginal objects and declared Aboriginal places is only permitted once an Aboriginal Heritage Impact Permit (AHIP) has been granted.
Working within the curtilage of the AHIP must be undertaken in accordance with the conditions of the AHIP. Comply with all AHIP conditions during construction.
If any Aboriginal object is found outside the AHIP area or before the AHIP is granted, cease all excavation or disturbance in the area and notify Sydney Water Project Manager in accordance with SWEMS0009.
If any non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify SW 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, go and no-go areas, processes and measures to avoid impacts, stop work procedures, and contact details to obtain further heritage guidance if needed.
For activities within Fleurs Radio Telescope Site, construction activities, access to, and equipment laydown/compound areas is to remain outside areas of known potential heritage as detailed in Figure 3-4, Figure 3-5, and Appendix F. This includes remnants of buildings, rubbish piles, brambles, timber bridge footings, power poles, parabolic antennae, and other structures on site.
Implement a 5 m buffer no-go zone around each item of potential heritage significance.

Mitigation measures

Chance discovery of relics must be notified to the Heritage Council of NSW by means of an [s146 notification](#).

If reburial is to be undertaken of objects, Requirement 26 “Stone artefact deposition and storage” in the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW must be complied with, unless the registered Aboriginal stakeholders agree to an alternative deposition method. If reburial is to take place, registered Aboriginal stakeholders would be notified and given the opportunity to attend, and the reburial recorded on AHIMS.

Archaeological salvage excavation of Aboriginal objects is to be completed prior to commencing construction works within the impacted portion of the following Aboriginal archaeological sites; SCW T1, SCW T2, Elizabeth Drive AFT 1 (includes Elizabeth Precinct PAD 03), Western Road AFT 1 and Rossmore Grange AFT 1.

Surface collection of Aboriginal objects is to be completed prior to commencing construction works within the impacted portion of the following Aboriginal archaeological sites; SCW T1, SCW T2, Elizabeth Precinct Isolated Find 06 (EP IF 06), Elizabeth Drive AFT 1 (includes Elizabeth Precinct PAD 03), 30-40 Martin Road Artefact Scatter 01, BCBW18 AS 02, Western Road AFT 1, Rossmore Grange, Rossmore Grange AFT 1, Medich Place AFT 1, Medich Place AFT 2.

No-go areas (Aboriginal and non-Aboriginal heritage) are to be delineated prior to works beginning on site to prevent impact. This includes:



- South Creek and South Creek, Exeter House TRE 1
- the non-impacted portion of sites SCW T1, SCW T2, Elizabeth Drive AFT 1 (includes Elizabeth Precinct PAD 03), 30-40 Martin Road Artefact Scatter 01, BCBW18 AS 02, Rossmore Grange and Rossmore Grange AFT 1. The boundary of the AHIP at these locations will be surveyed and protective hard barriers (i.e. ATF fencing, concrete barriers or water-filled barriers) and signage will be installed before construction.
- surface features identified in Appendix G and Appendix F (Fleurs Radio Telescope Site). Apply 5 m buffer.

Works within existing AHIP areas must not proceed until a written agreement with the AHIP holder for Sydney Water to work under each AHIP (SSI 9364; SSI 8609189; C00005620; AHIP C0002788) is in place. Prior to commencing any work Sydney Water must confirm what salvage works pertaining to the AHIP have been completed in the AHIP area and any relevant conditions satisfied.

6.2.5 Noise and vibration

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, noise from nearby development sites and construction activities within the growth area, combined with noise from the mixed rural residential environment. With future planned development and growth throughout the



region, the study area will provide land for a range of uses predominantly related to employment, industry, and environmental uses.

Equipment and timing of works

The assessed scope of work is summarised below in Table 6-12. The construction program is expected to be about two years, total. Nightwork, whilst not currently planned, may be required for works within/adjacent to roadways to minimise impacts to traffic (pending ROL requirements).



The proposal will generate noise and vibration during construction from plant and associated construction activities. Equipment, vehicles and machinery that would typically be used during construction of the proposal and that have potential to generate the most noise include:

- excavators (maximum 36 t excavator with hammer)
- rock breakers / jackhammers
- drill/piling rig
- backhoes
- concrete/demo saws
- compactor
- concrete pumps
- air compressors
- generators
- light and heavy vehicles movements.

Proposed use of noisy equipment during construction is summarised in Table 6-13 below. The excavator with hammer is required for rock breaking during excavation activities at some locations.



Table 6-12 Proposed scope of work and approximate duration of activities

Scope	Activities	Duration
Site mobilisation	Install compounds and access road, delineate construction corridor, install environmental controls, strip stockpiles, remove vegetation	1-2 months

Scope	Activities	Duration
Compound use	Ongoing use of amenities, storage, laydown, parking areas	24 months
Site demobilisation	Remove compounds and restore disturbed areas	1-2 months
TCGC01	<ul style="list-style-type: none"> Underbore 	11-12 months
TCGC02	<ul style="list-style-type: none"> Underbore 	11-12 months
SCGC01	<ul style="list-style-type: none"> Open trench Underbore 	1-2 weeks 14-15 months
TCPM01	<ul style="list-style-type: none"> Open trench Underbore 	4-5 months 5-6 months
SCPM01	<ul style="list-style-type: none"> Open trench Underbore 	3-4 months 4-5 months
SP1243 and overflow	Construction including <ul style="list-style-type: none"> Overflow pipe Emergency storage structure Electrical switchroom Odour control unit Access road Wet well Inlet maintenance hole Valve chamber Surge tank slab and platform Intermediate maintenance hole 	22-24 Months
SP1228 (interim) and overflow		

Table 6-13. Proposed use of noisy equipment during construction

Activity	Noisier equipment required	Tasks requiring this equipment	Frequency of use of noisy equipment
SET UP			
Site mobilisation/ demobilisation	Grinders, concrete saws	Install fence/ footpath	Less than an hour, intermittently, about 20 times during mobilisation
Compound use	Grinders, demo saw	Cut pipe	Daily
TRANSIENT			
Open trench	Grinders, demo saw, 36 t excavators with hammer	Cut pipe/ reinforcement, excavation	Daily
HDD (trenchless)	Demo saw	Cut pipe and reinforcement	Daily
Microtunnelling (trenchless)	Demo saw, 36 t excavators with hammer	Cut pipe/ reinforcement Excavation of launch/ receival pits	Daily
STATIC			
New pumping station SP1243	Piling rig, concrete saw, grinders, 36 t excavators with hammer	Piling, excavation works	Daily
New pumping station (interim) SP1228			

Based on the above details, the noisiest activity would be the use of a 36 t excavator with hammer during excavation activities and will be used within standard construction hours.

Most work and deliveries will be scheduled to occur during standard daytime hours of:

- 7 am to 6 pm, Monday to Friday
- 8 am to 1 pm, Saturdays
- No work on Sundays or public holidays.

Nightwork, whilst not currently planned, may be required for works within/adjacent to roadways to minimise impacts to traffic (pending ROL requirements). Similarly, for safety and/or delivery of oversize equipment work outside these hours may be required. As a worst-case scenario, therefore, nightwork has been assessed in the event it is required.

The proposal is expected to take up to 2 years to construct, with much of the work set back from potential residential receivers or businesses or in low density rural settings, and therefore, only a limited number would be affected for extended periods of time.



Construction activities

Most of the pipeline will be constructed using trenchless methods which require less ground disturbance, and noise impacts will be buffered by depth below ground. Where open trenching methods are applied, the works at any one location are of short duration and will progress along the alignment. Although they still have the potential to temporarily impact on sensitive receivers, a receiver would not be exposed to noise impacts for every shift over the project duration.

For pumping station construction, the noisiest activities would be associated with bulk earthworks, including excavation and potential rock breaking. Sensitive receivers around the compounds, access roads, and new pumping stations are likely to be noise impacted to some extent over most shifts during the two-year construction period. These works are static and include a mix of noisier (e.g. concrete saw, excavator with hammer) and less noisy (e.g. light vehicle movement, excavator without hammer) activities.

The closest sensitive receiver to SP1243 is located about 450 m from the construction corridor and potential noise impacts are considered minor for this site. Although sensitive receivers are limited in number, the nearest to SP1228 (interim) is much closer at about 160 m. Due to the above details, separate noise impact assessments for proposal activities were completed and are presented below. These noise impact assessments consider impacts from stationary activities at pumping station sites and transient activities that will move along the proposed pipeline alignment (including overflow pipes and access track construction).

Noise impact assessments

Noise impact assessments were completed using the TfNSW Construction and Maintenance noise estimator tool (TfNSW, 2022).

The likelihood of noise impact during transient and stationary construction activities was assessed using Table 2 of the Draft Construction Noise Guideline (EPA 2020). The review indicated that the likelihood of noise impact will be medium-low risk and a quantitative noise impact assessment was undertaken. This risk level was selected as construction outside of standard construction hours is unlikely to be regular or often (with no night works proposed at the time of writing), being a semi-rural setting there are few sensitive receivers in proximity, and noisy works will occur intermittently throughout the construction program. There are also options for noise containment including the use of noise blankets. Also, once excavation has started noisy works such as rock breaking will be below ground level, providing a natural noise barrier. In addition, stockpiles of excavated material could be positioned to act as a barrier between works and the nearest receivers.

Noise area category

The TfNSW Construction and Maintenance noise estimator tool can be used to perform a basic noise assessment to capture predicted noise impacts at different distances for different types of receivers. The noise area category is chosen from the noise estimator tool to define an approximate background noise level for the environment surrounding the proposal (Table 6-14). The noise area category is chosen based on several factors, including:

- surrounding land use and receiver types
- traffic volumes on nearby roads

- other transport infrastructure e.g. trains, airports/flight paths.

The noise area category R1 was chosen for both day and night work and for transient and stationary construction activities, because:

- background noise is influenced by distant road traffic noise and small volumes of traffic from local roads and,
- the surrounding area is predominantly a rural residential/agricultural setting.

Table 6-14 Background noise levels and noise management levels applied.

	Noise area category	R1
RBL or LA ₉₀ Background level (dB(A))	Day	40
	Evening	35
	Night	30
LA _{eq} (15minute) Noise Management Level ₂ (dB(A))	Day	50
	Day (OOHW)	45
	Evening	40
	Night	35

Notes: ¹LA₉₀ = Background noise level

²Noise Management Level for works during standard hours = Background level plus 10dB(A)

Noise Management Level (NML) for out of hours works = Background level plus 5dB(A).

Worst-case noise impact scenarios

The purpose of the noise assessment is to assess the predicted worst-case noise impacts. This will identify recommended additional mitigation measures for impacted receivers at different distances from the works, which will guide the community engagement for the sites.

- For transient construction activities, including open excavation and trenchless construction of pipelines, overflow, and access track construction, the noisiest plant scenario was applied and consisted of i.e. the 13.5 t excavator with hammer (being the largest size able to be selected in the estimator tool).
- For stationary activities, anticipated at pumping station locations, the preset bulk earthworks scenario was selected from the tool and applied. In the estimator tool, bulk earthworks encompass activities including formation of road alignment, excavation of soil and rock, hammering/rock breaking, drilling, loading, haulage, compacting of fill areas, and grading. Typical equipment captured by this scenario includes medium to large size vehicles, 35 t excavator, and hydraulic hammer.

As a conservative, worst-case approach, both day and night based scenarios were applied, even though the use of the noisiest equipment outside of standard construction hours is unlikely to be regular or often.

These assessments are sufficient to predict and assess worst-case noise impacts since:

- The noisiest equipment would not be used all shift, every shift, during both day and night work, and is therefore a conservative estimate.

- Multiple pieces of equipment may be used at any one time for different activities at different locations. Assessing use of the noisiest plant across the full construction corridor, or, similarly, bulk earthworks for the entirety of stationary construction activities, is a representation of the cumulative noise impacts that may be experienced.
- For transient construction activities, no individual receiver would be impacted by noise every shift from these activities over the proposed two-year construction period.

A receiver may have line of sight, or no line of sight, to the proposal. Line of sight is the straight line between the noise source and the receiver. Receivers with line of sight would typically include those in front of the work, who do not have their view blocked by barriers such as terrain (e.g. a large hill), permanent noise walls or other buildings. Receivers with no line of sight (all other factors being equal, such as distance to the work and type of equipment) will experience less noise than receivers with line of sight. Typically, these include the receivers who have their view blocked from the works by barriers including those listed above.

Noise impact summary

In summary, two assessments, each with two temporal scenarios were considered:

- Alignment (transient activities)
 - Activity 1: standard construction hours (day work) – line of sight – 13.5 t excavator with hammer distance based (noisiest plant)
 - Activity 2: OOHW night – line of sight, no line of sight – substantial solid barrier – 13.5 t excavator with hammer distance based (noisiest plant).
- Pumping station (stationary activities)
 - Activity 1: standard construction hours (day work) – line of sight – bulk earthworks distance based (scenario)
 - Activity 2: OOHW night – line of sight, no line of sight – substantial solid barrier – bulk earthworks distance based (scenario).

Based on the above scenarios, the predicted worst-case noise impacts for residential receivers associated with transient and stationary activities during day and night work are shown in Tables 6-15 to 6-18 and Figures 6-12 and 6-15, respectively. These outputs include recommended mitigation measures at different distances from sensitive receivers, as identified by the noise estimator tool. These are to be considered by the community team and offered where appropriate.

All reasonable and feasible measures will be implemented to reduce noise impacts during construction, therefore potential noise impacts are considered minor.

Table 6-15. Affected distance (metres) for residential receivers (day) – Activity 1 Noisiest Plant

Receivers	LAeq(15minute) noise level above background (LA90)		
	20 to 30 dB(A)	> 30 dB(A)	LAeq(15minute) 75dB or greater
	Moderately intrusive	Highly intrusive	Highly affected
Residential – line of sight	215	105	60
Residential – no line of sight	150	60	35
Recommended additional mitigation measures (Appendix J)	Notification (N)	N	N Phone Call (PC) Respite Offer (RO)

Table 6-16 Affected distance (metres) for residential receivers (OOHW) – Activity 2 Noisiest Plant

Activities	LAeq(15minute) noise level above background (LA90)				
	5 to 10 dB(A)	10 to 20 dB(A)	20 to 30 dB(A)	> 30 dB(A)	LAeq(15minute) 75dB or greater
	Noticeable	Clearly audible	Moderately intrusive	Highly intrusive	Highly affected
Residential – line of sight	1340	940	455	215	60
Residential – no line of sight	940	655	315	150	35
Recommended additional mitigation measures (Appendix J)	Notification (N)	N Respite Period 2 (R2) Duration Respite (DR)	N, R2, DR Specific Notification (SN) Phone Call (PC)	N, R2, DR, SN, PC Alternative Accommodation (AA)	N, PC Respite Offer (RO)

Table 6-17. Affected distance (metres) for residential receivers (day) – Activity 1 Bulk Earth

Receivers	LAeq(15minute) noise level above background (LA90)		
	20 to 30 dB(A)	> 30 dB(A)	LAeq(15minute) 75dB or greater
	Moderately intrusive	Highly intrusive	Highly affected
Residential – line of sight	230	105	60
Residential – no line of sight	155	60	30
Recommended additional mitigation measures (Appendix J)	Notification (N)	Notification (N)	N Phone Call (PC) Respite Offer (RO)

Table 6-18 Affected distance (metres) for residential receivers (OOHW) – Activity 2 Bulk Earth

Activities	LAeq(15minute) noise level above background (LA90)				
	5 to 10 dB(A)	10 to 20 dB(A)	20 to 30 dB(A)	> 30 dB(A)	LAeq(15minute) 75dB or greater
	Noticeable	Clearly audible	Moderately intrusive	Highly intrusive	Highly affected
Residential – line of sight	1430	1010	485	230	60
Residential – no line of sight	1010	700	335	155	30
Recommended additional mitigation measures (Appendix J)	Notification (N)	N Respite Period 2 (R2) Duration Respite (DR)	N, R2, DR Specific Notification (SN) Phone Call (PC)	N, R2, DR, SN, PC Alternative Accommodation (AA)	N, PC Respite Offer (RO)

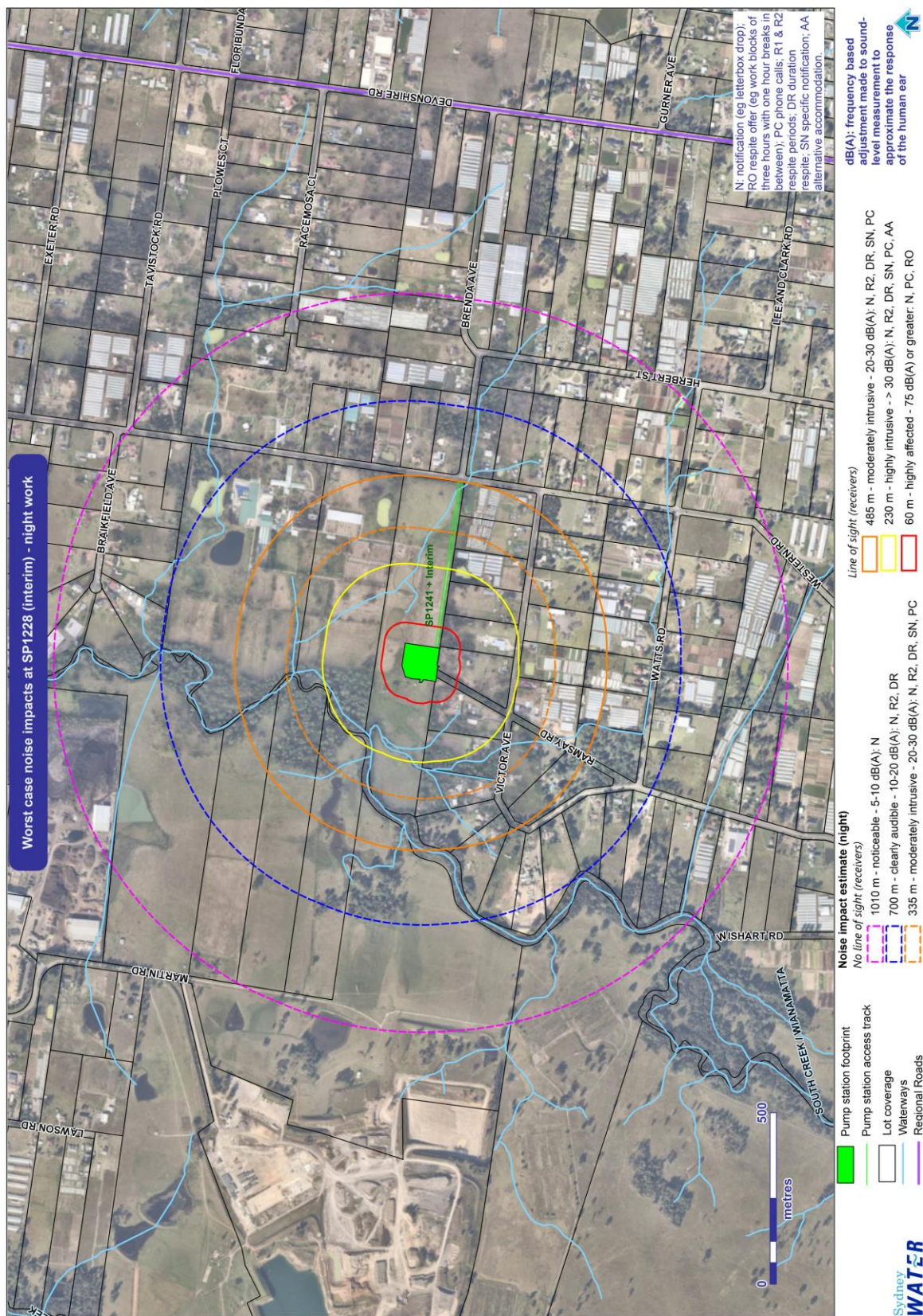


Figure 6-12 PS1228 interim Night Bulk Earth

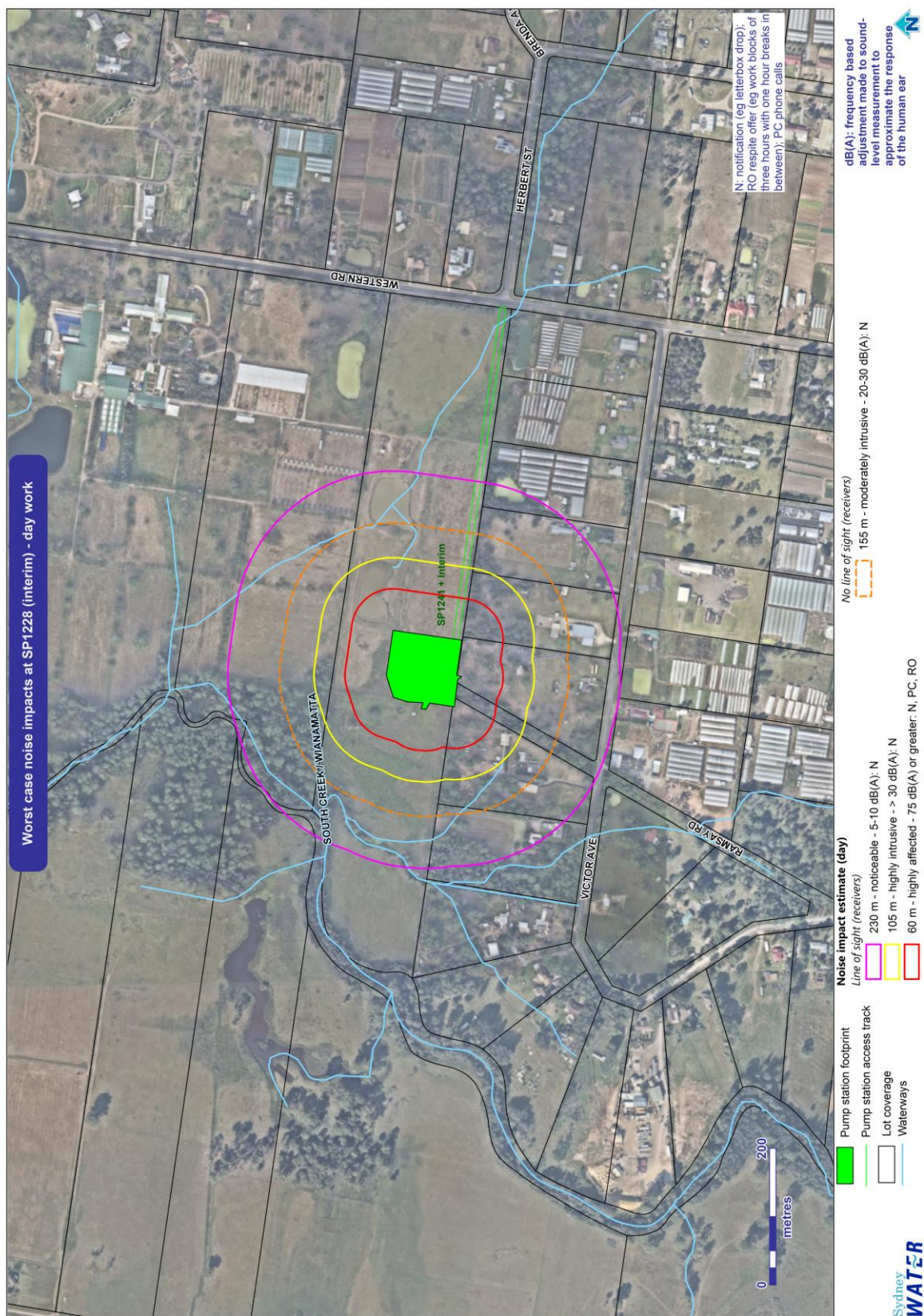


Figure 6-13 PS1228 interim Day Bulk Earth

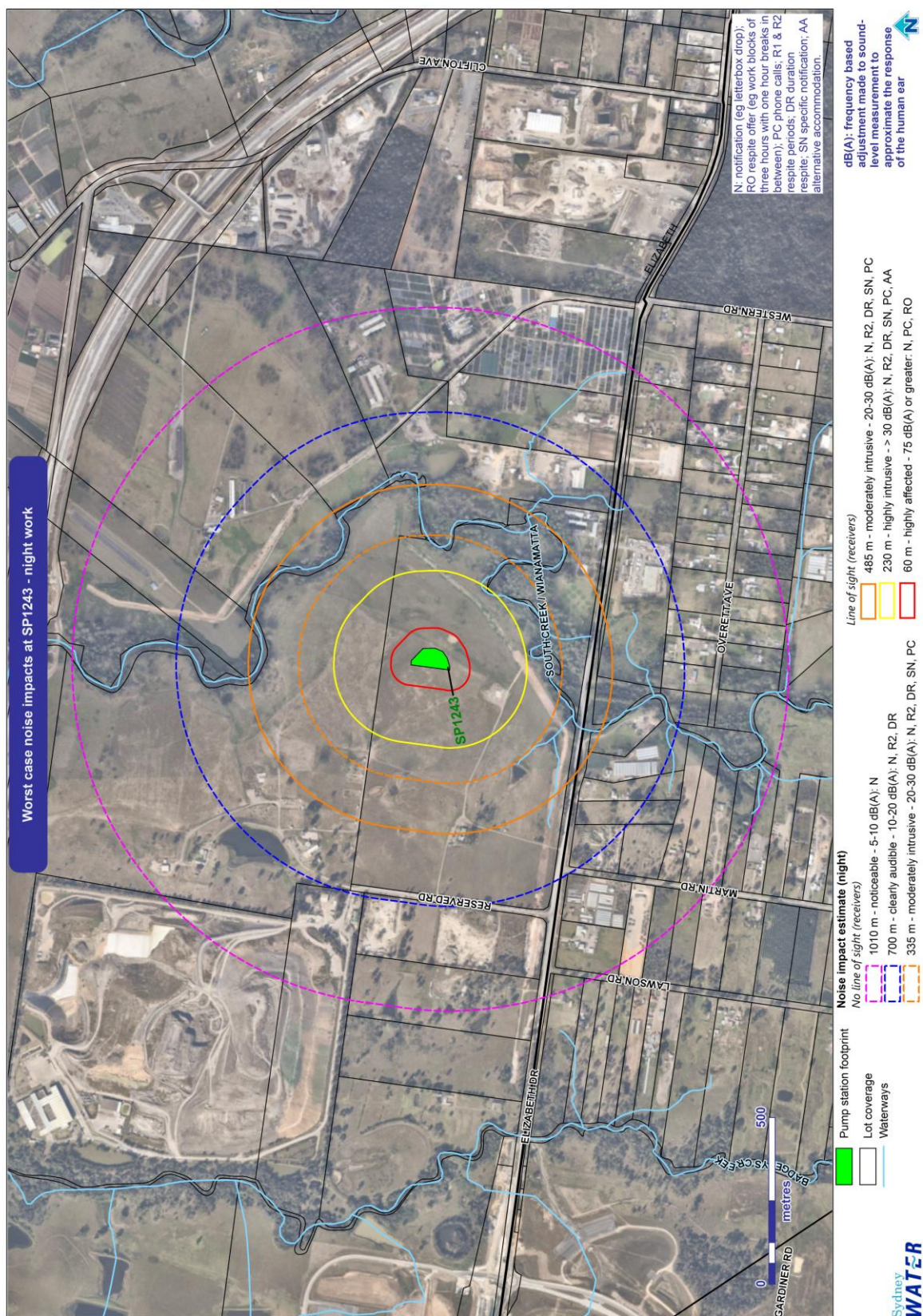


Figure 6-14 PS1243 interim Night Bulk Earth

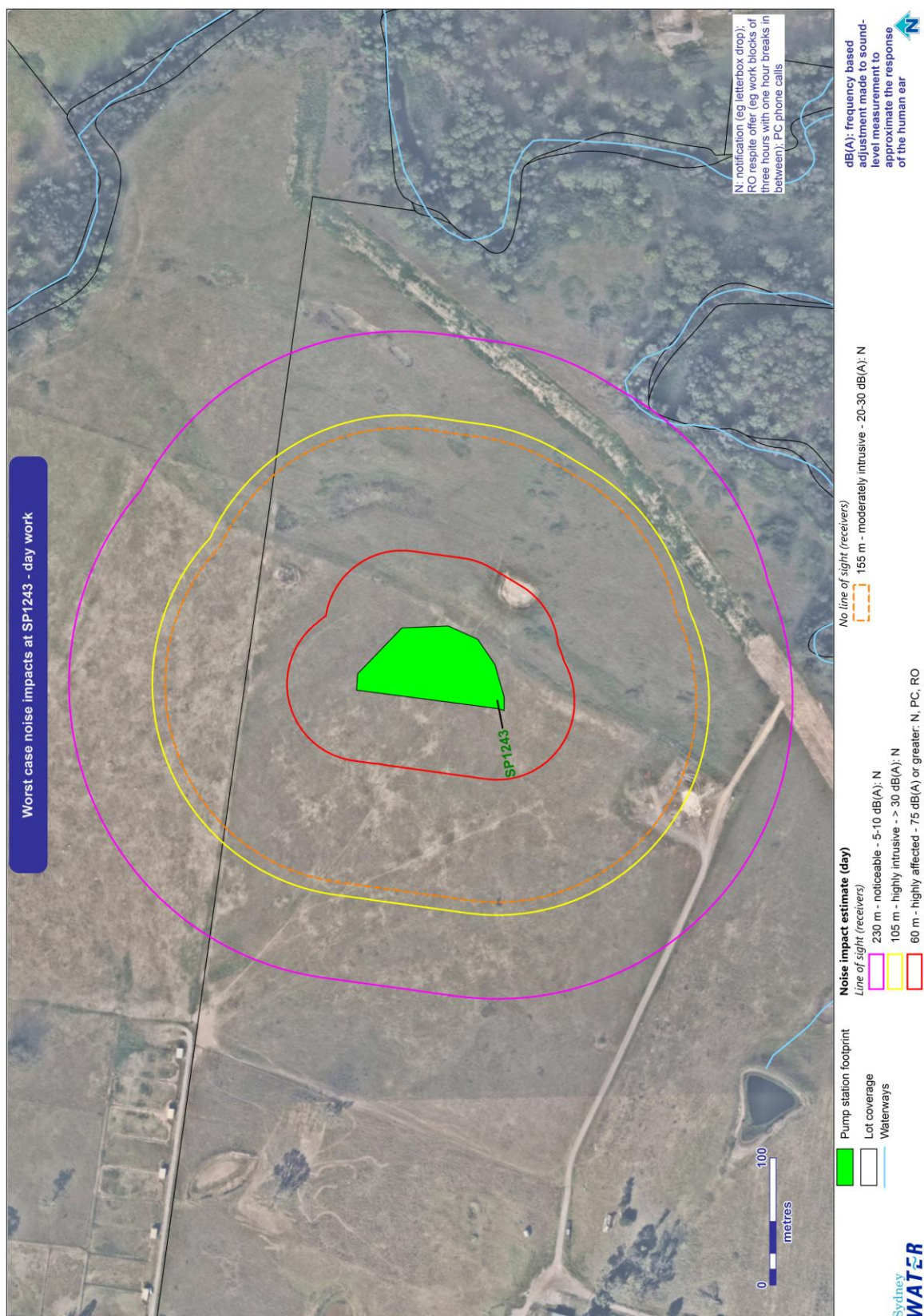


Figure 6-15 PS1243 interim Day Bulk Earth



Operational impacts

During operation, the alignment will be beneath the ground and no noise impacts are anticipated. Operational noise from the pumping stations is likely to be minimal and would not result in a detectable noise increase perceptible to existing nearby residents. The pumping stations are not expected to be intrusive to potential future receivers that would be in closer proximity as it consists of underground, submersible pumps and will be designed to comply with the EPA Noise Policy for Industry (2017). Operational noise levels will be assessed during detailed design and any noise attenuation measures identified and implemented to ensure compliance with the Noise Policy for Industry (EPA, 2017).

Noise may be generated during operational maintenance activities. However, these would generally be of short duration and mitigated through application of standard mitigation measures.

Vibration

The noise estimator includes some indicative minimum working distances for different vibratory plant and equipment. These distances will vary depending on the item of plant, local geotechnical conditions, and the frequency of vibration. However, where works are performed within the minimum working distances of a structure, structural damage may occur, and vibration mitigation measures are recommended (Table 6-19).

Based on the plant and equipment list anticipated for this proposal, the following vibratory plant and equipment may be used:

- small (5 to 12 t) hydraulic hammer – minimum working distance of 2 m
- medium (12 to 18 t) hydraulic hammer – minimum working distance of 7 m
- large (18 to 34 t) hydraulic hammer – minimum working distance of 22 m
- Mechanised bored tunnelling works (Horizontal Directional Drilling, Micro-tunnelling) – minimum working distance of 5 m to 12 m.

There is potential that some nearby residential buildings may be impacted by vibration when using the excavator with hammer; however, no substantial vibration-generating construction work would be occurring directly adjacent, or near physical structures.

In relation to human comfort, the minimum working distance of 73 m for 36 t excavator with hammer relates to continuous vibration. Vibration emissions will be intermittent in nature and for this reason higher vibration levels, occurring over shorter periods are consistent with Assessing vibration – a technical guideline (DEC 2006). Significant vibration impacts are therefore considered to be unlikely.

Mitigation measures

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

Table 6-19 Environmental mitigation measures — noise and vibration

Mitigation measures
<p>Works must comply with the Interim Construction Noise Guideline (DECC 2009), including schedule work and deliveries during standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturday. No work to be scheduled on Sundays or public holidays.</p> <p>The Proposal will also be carried out in accordance with:</p> <ul style="list-style-type: none">• Sydney Water's Noise Management Procedure SWEMS0056• Noise Policy for Industry (EPA, 2017). <p>All reasonable and feasible noise mitigation measures should be justified, documented and implemented on-site to mitigate noise impacts. All community notification will begin prior to work commencing on site.</p> <p>Incorporate standard daytime hours noise management safeguards into the CEMP:</p> <ul style="list-style-type: none">• identify and consult with the potentially affected residents prior to the commencement:<ul style="list-style-type: none">○ describe the nature of works; 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 works near residences)○ acceptance by the community of longer construction periods in exchange for restriction to construction times.• implement a complaints handling procedure for dealing with noise complaints• plant or machinery will not be permitted to warm-up near residential dwellings before the nominated working hours.• appropriate plant will be selected for each task, to minimise the noise impact (e.g. all stationary and mobile plant will 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, minimise use of vehicle reversing alarms).• schedule noisy activities around times of surrounding high background noise (local road traffic or when other noise sources are active). <p>If night works are needed, the Contractor would:</p> <ul style="list-style-type: none">• justify the need for night works• consider potential noise impacts and implement the relevant standard daytime and out of hours safeguards and other reasonable and feasible management measures• identify community notification requirements (i.e. for scheduled night work (not emergency works)),• notify all potentially impacted residents and sensitive noise receivers not less than one week prior to commencing night work.

Mitigation measures

- seek approval from the Sydney Water Project Manager in consultation with Sydney Water's Environment and communications representatives.

If works on Sundays or public holidays are required, the Contractor would:

- justify why all other times are not feasible
- consider potential noise impacts and, implement relevant standard daytime, out of hours and night-time safeguards and other reasonable and feasible management measures
- identify community notification requirements
- seek approval from the Sydney Water Project Manager in consultation with Sydney Water's Environment and communications representatives.

Community engagement will begin before work starts, with notification to impacted residents and businesses within the zone of influence. Consider worst-case noise impact scenarios during night works and day works when identifying stakeholders to be notified.

This may also include face to face engagement and door knocks. Consultation will include number of night shifts per week and mitigation measures to be adopted.

Community preference will determine if shifts can extend to more than 2 night shifts per week and the appropriate respite periods.

Ongoing engagement will continue on an ad-hoc basis. For sensitive receivers / highly impacted residents, regular follow-up will be done (i.e. one-on-one meetings, emails, texts, phone discussions).

Engagement during construction will be ongoing and include proactive management of issues to minimise complaints. Where complaints and enquiries arise, action will be taken to address these with appropriate mitigation adopted.

Consider less vibration intensive methodologies where practicable and use only the necessary sized and powered equipment.

Conduct a dilapidation survey / asset condition assessment prior to works which have potential to damage existing structures.



Select equipment to minimise vibration where possible.

Monitor compliance with the recommended vibration levels in DIN 4150-3 1999: Structural Vibration – Part 3; Effects of vibration on structures.

6.2.6 Air and energy

Existing environment and potential impacts

The proposal is in a rural-residential area that will be transformed from lower density and less intensive land uses, buildings and structures to employment, industry, and residential growth uses. The main existing sources of air pollutants within the study area include emissions from motor



vehicles and dust from nearby development. A search of the National Pollutant Inventory, maintained by the Department of Environment and Energy, was conducted for the study area on 13th March 2024. The search identified three pollutant emitting facilities within 1 kilometre of the study area, but more than 200 m from the proposal:

- Boral Bricks PTY LTD (brick manufacturing)
- Inghams Enterprises PTY LTD (poultry farming)
- SEI Kemps Creek Landfill Cogeneration (Sustainable Energy Infrastructure).

Potential sensitive receivers include:

- residents, pedestrians and road users
- industrial warehouse and development sites
- primary production properties.

Potential construction impacts

During construction, the following activities would potentially generate air emissions and dust which could impact air quality:

- emissions from machinery, equipment and vehicles used during construction
- dust generated by construction vehicles travelling on disturbed/unsealed access routes, prior to installation of the sealed access road
- during excavation and stockpiling.

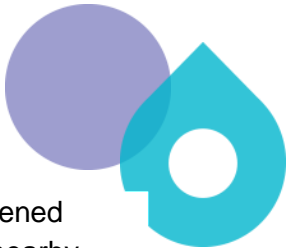

During construction, dust and exhaust gases (air emissions) could impact the air quality and amenity of nearby sensitive receivers, and would be dependent upon atmospheric conditions. Construction work and restoration of disturbed areas will be undertaken progressively. This will minimise potential air quality impacts and reduce the exposure of any one sensitive receiver to air emissions. These potential air quality impacts will be localised and short-term in nature, and unlikely to have a significant impact with the application of the environmental mitigation measures below.

Potential operational impacts

The proposal has been designed with appropriate ventilation and odour management systems to minimise operational odour impacts at nearby sensitive receivers. The locations of vents will be determined during detailed design.

Odour and corrosion modelling will be completed during detailed design of the project. Space has been allocated within each pumping station footprint for an OCU.

Ventilation of the sewer is required, and maintenance holes will be equipped with educt and induct vents at maximum spacings of 400 m along the alignment. Vent shafts are designed to be close to existing or future open spaces where possible to reduce visual and odour impacts. Vent shafts are nominally sized with a DN300 shaft and height of 18 m, subject to confirmation by Sydney Water during detailed design.



During operation, wastewater maintenance holes and the pumping station may be opened when maintenance or repair works are required. This may result in odour impacts to nearby receivers which would largely be dependent on wind direction and strength. These impacts would be temporary in nature and appropriate safeguards would be implemented to minimise the potential for adverse impacts wherever possible.

Sydney Water will manage odour in accordance with the requirements of the POEO Act and Sydney Water's existing procedures. Sydney Water would register and investigate odour complaints. Sydney Water will implement engineering, operational or other odour reduction measures where verified complaints are received about odour releases from the wastewater system. Significant odour impacts from the proposal are considered unlikely.

During operation, the pumping stations would require energy usage, and marginally increase Sydney Water's total energy use. Although, this would not reduce the availability of energy to nearby developments. The proposal would be operated in accordance with energy use procedures that apply to Sydney Water's existing network.

Mitigation measures

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

Table 6-20 Environmental mitigation measures — air and energy

Mitigation measures
Use alternatives to fossil fuels where practical and cost-effective.
Track energy use as per SWEMS0015.28 Contractor NGER template.
Maintain equipment in good working order, comply with the clean air regulations of the <i>Protection of the Environment Operations Act 1997</i> , have appropriate exhaust pollution controls, and meet Australian Standards for exhaust emissions.
Switch off vehicles/machinery when not in use.
Implement measures to prevent offsite dust impacts, for example: <ul style="list-style-type: none">• water exposed areas (using non-potable water source where possible such as water from excavation pits)• cover exposed areas with tarpaulins or geotextile fabric• modify or cease work in windy conditions• modify site layout (place stockpiles away from sensitive receivers)• vegetate exposed areas using appropriate seeding.
Cover all transported waste.
Minimise the potential for odours (e.g. select appropriate heights for vent stacks, install carbon canisters on existing air valves, minimise the number of open access chambers.).



6.2.7 Waste and hazardous materials

Existing environment and potential environmental impacts

Our 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 our suppliers to minimise waste.

The proposal has the potential to generate the following waste streams:

- general construction waste such as excess concrete, redundant pieces of pipe/fittings, tanks
- broken bricks, timber, paper, plastic and metal
- green waste from clearing vegetation including weeds
- domestic waste including food scraps, aluminium cans, glass bottles, plastic and paper containers, and putrescible waste generated by site construction personnel
- wastewater and grey water from temporary amenities
- spoil that is not suitable for backfilling, from trenching and other excavations
- groundwater dewatered from excavations
- wastewater and drilling fluid generated from trenchless construction and the compound sites.

The largest volume of waste generated by construction would be excess spoil from excavations. Wherever possible, suitable excavated spoil would be re-used on site for backfilling, landscaping and other uses. Should any material be found to be unsuitable, it would be disposed of as detailed in the mitigation measures below. If spoil is unable to be re-used on-site, opportunities for off-site re-use would be investigated.

If re-use opportunities are unable to be identified, or 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.

Construction by trenchless methods will involve the use of drilling fluids. The drilling fluids that will be used will be an environmentally benign substance such as bentonite. The drilling fluids will be circulated through the trenchless section and then screened to remove drill cuttings. Any waste drill cuttings and drilling fluid will be tested, classified, treated and disposed of appropriately.

General workforce waste including food packaging will be generated in minor quantities and will be classified as putrescible or non-putrescible general solid waste.

No hazardous wastes are expected to be generated. It is not expected that the proposal will involve managing hazardous waste or HBM. Should the works uncover asbestos or any other hazardous or contaminated material, it will be managed through an unexpected finds procedure.

Opportunities to reduce, recycle and reuse on this project would be sought with the Contractor and documented in the Waste Management Plan or CEMP.

Operational impacts

Operation of the proposal may generate minor volumes of waste during maintenance activities. Any water discharged would be in accordance with Sydney Water's Discharge Protocols Standard Operating Procedure. 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.

Mitigation measures

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

Table 6-21 Environmental mitigation measures — waste and hazardous materials

Mitigation measures
Manage waste in accordance with relevant legislation and maintain records to show compliance e.g. waste register, transport and disposal records. Record and submit <u>SWEMS0015.27 Contractor Waste Report</u> .
Seek approval and discharge criteria from the relevant Sydney Water Network Area Manager prior to discharge to the wastewater system. Otherwise, tanker by a licensed waste contractor and dispose off-site to an appropriately licensed facility.
Provide adequate bins for general waste, hazardous waste and recyclable materials.
Minimise the generation of waste, sort waste streams to maximise reuse/recycling in accordance with the <u>Waste Avoidance and Resource Recovery Act 2001</u> .
Manage waste and excess spoil in accordance with the NSW EPA Waste Classification Guidelines. Where materials are not suitable or cannot be reused onsite or offsite, recycle soils at a licensed soil recycling facility or dispose at an appropriately licenced landfill facility.
Prevent pollutants from escaping including covering skip bins.
Dispose excess vegetation (non-weed) that cannot be used for site stabilisation at an appropriate green waste disposal facility.
Minimise stockpile size and ensure delineation between different stockpiled materials.
If fibro or other asbestos containing material is identified, restrict access and follow Sydney Water's Asbestos Management – Minor Works procedure, Document Number 746607. Contact Sydney Water Project Manager who will consult with the Contamination and Hazardous Building Materials team [REDACTED]
The contractor should use the Sydney Water Material Stockpile and Material Receiver Dashboard and Register to identify potential opportunities for spoil reuse between projects. The Material Receiver Dashboard can also be used to identify suitable waste facilities for material that cannot be reused. It can be accessed via the SWDelivery Portal.



6.2.8 Traffic and access

Existing environment and potential impacts

The majority of the proposal is on private property, with some crossings beneath or running adjacent to several local and classified roadways, including:

- M12 Motorway (currently under construction)
- Elizabeth Drive (State)
- Pitt Street (Local)
- Lawson Road (Local)
- Cuthel Road (Local)
- Martin Road (Local)
- Victor Avenue (Local)
- Watts Road (Local)
- Ramsay Road (Local)
- Fifteenth Avenue (Local)
- Kelvin Park Drive (Local).



Most of the proposal will be located away from local roadways, crossing through open paddocks and rural lots. Where the alignment is proposed within the road corridor, however, local bus routes have the potential to be affected by the proposal. Where required, bus stops would be temporarily relocated during construction. This may have a minor impact on those using the bus stop, however the new location of the bus stop would be located at an appropriate nearby location. Consultation with the bus authority will be undertaken.

Potential impacts – construction

The works will require partial road closes along some sections of the alignments. Partial road closures will typically involve temporary closure of one lane of traffic adjacent to pipeline construction to accommodate equipment, removal of spoil and delivery of bulk materials. This may result in traffic delays and/or traffic diversions depending on the number of lanes available. Generally, these temporary partial closures will only occur when trenching works are in progress.

Along all roads, private property driveways would be temporarily impacted from pipe installation. As this is a linear activity, the driveways would not be blocked for a significant amount of time. Any loss of driveway access would be communicated to the residents in advance and managed through traffic control. The construction corridor crosses private properties, road reserves and electricity transmission line easements. The delivery contractor would liaise with the relevant landholders to confirm site access arrangements.

The proposal will require a construction workforce of up to 60 people, and between 30 to 60 vehicle movements at a given time across the alignment. The proposal is predominantly accessed via existing local roads and informal access tracks through paddocks.



New access tracks will be required for both pumping stations. The proposed main access for SP1228 (interim) will be from Western Road, Kemps Creek which is a local road. This will provide access to the future ultimate facility SP1241 once constructed. A new access driveway, off estate roads to be developed by Mirvac in their EPP, is required for SP1243. Estate roads will ultimately connect back to Elizabeth Drive but are yet to be developed. Permanent access to each pumping station will include a dual lane all-weather sealed access road (minimum 8 m wide), with kerb and gutter plus surface and subsurface drainage systems (as required) to the nearest public road. A vehicle turning area designed to fit a 19 m semi-trailer will be provided at each pumping station site. A minimum of four spaces for vehicle parking will be allowed for. Bollards shall be placed, where required, to protect the wet well, valve chamber, and above ground structures from vehicles.

Once compound and access road plans have been confirmed, the Contractor will consult with Council and TfNSW as required by the ISEPP.

Based on information available during concept design, the REF assumes access to the alignment will be via the approved construction corridor and existing sealed roadways. Access to private property may be temporarily affected during construction of the pipelines. Properties will only be affected for a relatively short period of time. Some fence lines may need to be temporarily removed for access. Property owners will be informed of any potential loss of access and appropriate measures will be negotiated to either provide an alternative access or reinstate access at the end of the day. Any access ways or fences affected by construction will be reinstated to their original condition.

Potential impacts – operation

Operation of the proposal would result in negligible impacts to traffic or access, as maintenance works would be minor in nature and infrequent. Maintenance activities would be undertaken in accordance with Sydney Water's existing procedures which would minimise the potential for traffic and access impacts. Sydney Water will maintain access to the pumping station while the area is being developed by Mirvac. Future access to the pumping station will be via public local road within the EPP. This should not cause traffic impacts during operation, as members of public would not be able to access the pumping station and there should be enough space within the pumping stations for staff vehicles to park.

Mitigation measures

With the implementation of the mitigation measures below, impacts to traffic and access can be adequately managed, and residual impacts are expected to be low.

Table 6-22 Environmental mitigation measures — traffic and access

Mitigation measures
Prepare a Traffic Management Plan (TMP) in consultation with the relevant traffic authority.
Meet NSW Roads and Maritime Service's Traffic Control at Worksites Manual v5 requirements for TfNSW roads. The Contractor will obtain a Road Occupancy Licence (ROL) from TfNSW, including if works are within 100 m of traffic signals when construction commences.

Mitigation measures

Once compound locations have been confirmed, the Contractor will consult with council as required by the ISEPP and details incorporated into the CEMP.

The location of temporary access roads outside the construction corridor would be confirmed by the delivery contractor and would be subject to additional environmental assessment that must be submitted to Sydney Water for approval. Property owners would be consulted regarding potential reductions in access to portions of their property and the location of access roads, and temporary access arrangements would be developed for the duration of the construction period.

Minimise traffic impacts near residential properties, schools and businesses by consulting with them (e.g. no major materials deliveries at school drop off or pick up times etc.).

Manage sites to allow people to move safely past the works, including alternative pedestrian, bicycles, pram and wheelchair access.

Consult with the relevant traffic authority about managing impacts to pedestrian traffic, signposting, meters, parking, line-marking or if traffic control or pavement restoration is required.

Erect signs to inform road users of the proposed works and any temporary road closures.

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.

The contractor must consult with the M12 constructor about traffic management in and around the M12 construction corridor.

6.2.9 Social and visual



Existing environment

The existing visual environment is representative of a rural-residential area interspersed with areas of new development associated with residential estates, road transport upgrades and the Western Sydney Airport. Residential properties are predominantly single or double story detached dwellings on acreage lots. The proposal is currently within a rural-residential area, however future changes anticipated for the area include employment, industry, and higher density residential growth.

The proposed wastewater infrastructure is located within 200 m of several light industrial or agricultural businesses including Cleanaway Kemps Creek Resource Recovery Park, Inghams Enterprises breeder farm, Australian Native Landscapes and PGH Bricks site. The study area is also surrounded by rural, rural living and agricultural lots. Numerous lots are subject to earthworks for future growth, including the development of the USC AWRC.

The proposal could potentially impact on social amenity in a variety of ways, some of which have been assessed in other sections of this REF:

- Noise and vibration (Section 6.2.5)

- 
- 
- Air quality (Section 6.2.6)
 - Traffic and access (Section 6.2.8).

The proposal will have an overall 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.

Potential construction impacts

During construction, there would be temporary impacts on visual amenity from equipment, generation of waste and construction activities such as earthworks within the construction corridor. There will also be some temporary visual impacts associated with the establishment of site compounds and worksites during construction. These temporary visual impacts would be mitigated in consultation with stakeholders, such as council and residents, and the mitigation measures listed below.

Following the completion of the works, all items associated with construction would be removed and the site would be remediated. Disturbed areas would be rehabilitated to pre-existing condition or better, as far as practicable. Revegetation restoration may take a longer period to become established. 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 works would be temporary and short-term.

Potential operational impacts

The works will involve the construction of new, permanent above ground structures, including the pumping station buildings and vent stacks. This would increase the visual prominence of the pumping station to current surrounding receivers, as well as future residents in the precinct. Considering the future use and growth of the precincts, however, these new above ground structures are not expected to significantly impact the visual character of the environment. Rather, once operational, the proposal would have significant social benefits, enabling the development of the region by providing a wastewater network that supports planned growth in Western Sydney.

Long-term social and visual impacts are limited due to the predominance of underground wastewater network assets. These assets include wet well/valve chambers, inlet maintenance holes, overflow gas check structures, vent shaft footings and pipework.

As the precincts are planned to be developed for urban purposes, the visual and social context in which the proposal would be operated would differ from that present before construction. For example, any above-ground structures would become less prominent so the visual impacts would reduce over time. Additionally, the pumping stations will be landscaped to minimise any permanent visual impacts.

Mitigation measures

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

Table 6-23 Environmental mitigation measures — social and visual

Mitigation measures
Undertake works in accordance with Sydney Water Communications policies and requirements including: <ul style="list-style-type: none">• notify impacted residents and businesses• erect signs to inform the public on nature of work• personnel treat community enquiries appropriately.
Work sites will be restored to pre-existing condition or better.
Minimise visual impacts (e.g. retain existing vegetation where possible).
Direct artificial light away from sensitive receivers where possible (i.e. residents, fauna or roadways).
Maintain work areas in a clean and tidy condition.
Site restoration including roads, verges and vegetation is to be performed in consultation with private property owners and council.
The scale of ventilation shafts, and their final locations, would be confirmed during detailed design and would consider visual impacts on receivers. Consultation with affected landowners would be undertaken.
Continue to consult with key stakeholders that are constructing infrastructure in the area with a view to coordinate works where practicable.
Regular engagement with the local community and relevant stakeholders will be performed in accordance with the project Community and Stakeholder Engagement Plan to manage any impacts and ensure the scope of works performed by Sydney Water is communicated accurately.

6.2.10 Cumulative and future trends



Potential environmental impacts

The proposal is located in an area that is subject to ongoing development associated with the precinct and growth planning in Western Sydney. Cumulative impacts are unlikely given the small scale of the proposal relative to the overall works within the growth centre.

A search of the Department of Planning, Housing and Infrastructure's Major Projects Planning Portal was undertaken and identified several urban release projects planned for the area.

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

- cumulative noise and air quality impacts from works being undertaken concurrently
- potential traffic management issues during construction
- increased waste production
- community construction fatigue resulting from works being undertaken simultaneously or concurrently.



The proposal is required to support the future population growth in the south west and as such facilitates the progression of residential, commercial and industrial developments in the locality. Implementing the mitigation measure below will reduce the scale and extent of any potential cumulative impacts.

During operation, minor increases in noise and traffic are anticipated due to maintenance activities of proposed infrastructure. However, with the rapid development of the broader region, these additions to the greater environment are considered negligible.

Future trends such as climate change were considered including factors such as bushfires, flooding, extreme heat, and extreme storm events that could impact the proposal. The proposal is unlikely to be impacted by future trends because most infrastructure is proposed to be located below ground or will be situated predominantly outside the 1% AEP flood level.

Mitigation measures

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



Table 6-24 Environmental mitigation measures — cumulative and future trends

Mitigation measures
Coordination of works with other ongoing or proposed developments would be required to minimise negative impacts or conflicts with construction scheduling.

6.2.11 General environmental management

Table 6-25 Environmental mitigation measures — general environmental management

Mitigation measures
<p>Sydney Water's Project Manager (after consultation with Sydney Water's environmental and community representatives and affected landowners) can approve temporary ancillary construction facilities (such as compounds and access tracks), without additional environmental assessment or approval if the facilities meet the following principles:</p> <ul style="list-style-type: none">• 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 safeguards in the EIA• no disturbance of contaminated land or acid sulfate soils



Mitigation measures

- will be rehabilitated at the end of construction.

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

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

Prepare 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.

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

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

All site personnel must be inducted into the IMP.

Prior to construction, Sydney Water will seek a variation to the existing Scheduled Development Work EPL 21886. This REF will support the EPL variation application.

Complaints to be managed in accordance with Sydney Water's Complaints Procedure and relevant Community Engagement Plan.

Should the methodology or alignment change from the EIA, no further environmental assessment is required provided the change:

- remains within the study area for the EIA and has no net additional environmental impact
- is outside the study area for the EIA but:
 - reduces impacts to biodiversity, heritage or human amenity after consultation with any potentially affected landowners and relevant agencies
 - avoids engineering (for example, geological, topographical) constraints after consultation with any potentially affected landowners and relevant agencies.

The Contractor must demonstrate in writing how the changes meet these requirements, for approval by Sydney Water's Project Manager in consultation with the environmental and community representatives.



7 Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of Thompsons Creek and South Creek Catchments Wastewater Network project. The proposal is required to provide a reliable wastewater network that facilitates further development of the SWGA and WSA.

During construction, the main potential environmental impacts associated with the proposal include typical construction impacts such as, soil erosion, noise and traffic. Impacts to Aboriginal heritage and vegetation are expected and specialist assessments have been undertaken. Vegetation impacts will include certified and non-certified vegetation under biocertification orders. An Aboriginal Heritage Impact Permit (AHIP), and appropriate notification of vegetation clearing and offset requirements, must be met prior to construction activities commencing. During operation the potential impacts will be minor, relating to air quality and visual amenity at the pumping stations.

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 proposal has been considered in accordance with the principles of ESD. The proposal will result in positive long-term environmental improvements. 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.

8 References

NSW Environmental Protection Authority (EPA) 2017, NSW Noise Policy for Industry, NSW Government Sydney

NSW Environment Protection Authority (EPA) 2020, Draft Construction Noise Guideline, NSW Government Sydney

NSW Department of Planning and Environment (DPE) 2022, Greater Sydney Water Strategy PUB22/62 [Greater Sydney Water Strategy \(nsw.gov.au\)](https://www.nsw.gov.au/greater-sydney-water-strategy), NSW Government Sydney

Sydney Water 2023, Thompsons Creek and South Creek Catchments Wastewater Network Concept Design Report [Sydney Water Planning Partnership ISP Projects - P0000364-000000-00-REP-MC-0003.pdf - Name - Title - Rev - Status \(sharepoint.com\)](#)

Sydney Water 2024, Upper South Creek Networks Constructability Report: South Creek and Thompsons Creek Stage 1 and 2 [Constructability Audit Sugar Road Intersection Upgrade \(sharepoint.com\)](#)

Sydney Water Planning Partner (SWPP) 2023a, Thompsons Creek and South Creek Wastewater Preliminary Site Investigation (PSI)

Sydney Water Planning Partner (SWPP) 2023b, Thompsons Creek and South Creek Wastewater Geotechnical Desk Study (GDS)

Sydney Water Planning Partner (SWPP) 2023c, Thompsons Creek and South Creek Stage 1 Alignment and Pump Stations Detailed Site Investigation (DSI)

Extent Heritage 2021, [Upper South Creek Advanced Water Recycling Centre Project: Historical Archaeological Assessment](#)

CRM 2019, University of Sydney Western Sydney Lands: [Badgerys Creek Farm Centre, Elizabeth Drive, Badgerys Creek. Heritage Assessment](#)

Jacobs 2019, M12 Motorway Environmental Impact Assessment Statement [Appendix J Non-Aboriginal Heritage Assessment Heritage Assessment Report](#), Roads and Maritime Services

Sydney Water 2021, [Upper South Creek Advanced Water Recycling Centre Environmental Impact Statement](#), Sydney Water



Appendices



Appendix A – Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	<p>The proposal will involve temporary disturbance in the form of noise, air quality, visual impacts, and occasional residential access disruptions. The affected residence would be notified of these disturbances prior to the start of works. The most adverse impacts would be temporary and limited to noise impacts on the nearby sensitive receivers during construction.</p> <p>Once operational, the proposal will result in minor impacts to residents through the establishment of new above ground infrastructure. However, it is not anticipated that these impacts will cause significant disruption to the community. Further, the surrounding area will be subject to ongoing changes as the development plans for the precincts are realised, changing the area to a more urban character.</p> <p>There will be environmental improvements by providing a reliable wastewater service to the local community.</p>
Any transformation of a locality	<p>The proposed work will result in a minor transformation of the locality. However, following construction completion, work areas would be generally restored to pre-construction condition. New above ground infrastructure would include wastewater pumping stations at two localities and vent stacks along the alignment.</p> <p>All other elements of the proposal within the public realm will be located below ground.</p>
Any environmental impact on the ecosystems of the locality	<p>The proposed work will result in clearing of native vegetation, impacting ecosystems of the locality. Where possible, vegetation removal has been restricted to areas of certified land that have already been assessed. Some limited vegetation clearing within non-certified regions of the CPCP and SWGA are expected and will be offset accordingly.</p>
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	<p>The proposal would have the potential for minor impacts to amenity during construction, such as the generation of dust, noise and vibration, temporary disruption to access and reduction in visual amenity. These potential impacts would be managed and mitigated through implementation of the safeguards outlined in this REF. In the long-term, the value of the locality would be enhanced through the provision of wastewater infrastructure to accommodate the predicted population growth.</p>
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance	<p>The proposal will have a minor impact upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or</p>

Section 171 checklist	REF finding
or any other special value for present or future generations	<p>any other special value for present or future generations. These include:</p> <ul style="list-style-type: none"> • impact to Aboriginal heritage items • minor impacts to local heritage listed items. <p>All works that have the potential to impact Aboriginal artefacts and PADs will be managed by AHIP requirements. Controls will be implemented to prevent impacts to the Aboriginal heritage identified outside the AHIP areas. Controls will be implemented to protect the local heritage items during construction.</p>
Any impact on the habitat of any protected animals (within the meaning of the <i>Biodiversity Conservation Act 2016</i>)	The proposal will not have a significant impact on the habitat of protected animals. Some habitat features will be impacted, with offsets to be implemented.
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	The proposal will not be endangering any species of animal, plant or other form of life, whether living on land, in water or in the air.
Any long-term effects on the environment	The proposal will not have any long-term impacts on the environment but 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 will not cause the degradation of the quality of the environment.
Any risk to the safety of the environment	The proposal will not increase risk to the safety of the environment.
Any reduction in the range of beneficial uses of the environment	The proposal would partly reduce the range of beneficial uses of the environment. The construction corridor, compounds, and access roads would be unavailable for use by others during construction by others. Space available on the road corridor would be reduced while temporary lane closures are in place. The pumping stations would be on land that would no longer be able to be used for another purpose (e.g. recreation, residential).
Any pollution of the environment	During construction, the proposal has the potential to cause minor localised, noise and air pollution. These impacts would be temporary along the alignment, with some ongoing impacts associated with the operation of the pumping stations. Impacts would be managed through the implementation of the mitigation measures outlined in Section 6. Operational impacts of the pumping stations will be minor as these facilities are designed to operate within set standards. During operation, the proposal will

Section 171 checklist

REF finding

operate in accordance with the conditions of the future USC scheduled activity EPL.

Any environmental problems associated with the disposal of waste

Waste disposal will be in accordance with the environmental mitigation measures, and no environmental problems associated with the disposal of waste are expected.

Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply

The proposal will not increase demand on resources, that are, or are likely to become, in short supply.

Any cumulative environmental effect with other existing or likely future activities

Some nearby developments may be carried out at concurrent times to the proposal. This has the potential for short-term cumulative impacts.

Any impact on coastal processes and coastal hazards, including those under projected climate change conditions

The proposal will not have any impact on coastal processes or hazards, and coastal processes and coastal hazards will not 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

The proposal is to service growth and the applicable strategic planning statements or plans have been considered in the system planning and options selection process.

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?		✓
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		✓
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		✓
Connect to, and use a substantial volume of water from a council owned water supply system?		✓
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?	✓	
Excavate a road, or a footpath adjacent to a road, for which the council is the roads authority, that is not minor or inconsequential?	✓	
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?		✓
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?		✓
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)?		✓
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?		✓
Section 2.15, consultation with public authorities other than councils		
Will the proposal be on land adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i> or land acquired under Part 11 of that Act? <i>If so, consult with DPE (NPWS).</i>		✓
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? <i>If so, consult with DPE (NPWS).</i>		✓
Will the proposal include a fixed or floating structure in or over navigable waters? <i>If so, consult TfNSW.</i>		✓
Will the proposal be on land in a mine subsidence district within the meaning of the <i>Coal Mine Subsidence Compensation Act 2017</i> ? <i>If so, consult with Subsidence Advisory NSW.</i>		✓
Will the proposal be on land in a Western City operational area specified in the <i>Western Parkland City Authority Act 2018</i> , Schedule 2 and have a capital investment value of \$30 million or more? <i>If so, consult the Western Parkland City Authority.</i>	✓	
Will the proposal clear native vegetation on land that is not subject land (i.e. non-certified land)? <i>If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3</i>	✓	



<i>Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).</i>		
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Appendix C – USCN Community Outcomes Report

To protect privacy information and sensitive landowner data, the [USCN Community Outcomes Report](#) is not to be shared externally, outside of Sydney Water.

Appendix D – DPI Fisheries s.199 consultation

Department of Primary Industries
Department of Regional NSW



C24/280
16 May 2024

Re: Thompsons Creek and Wianamatta South Creek Wastewater Project – 295 Western Road Kemps Creek - Lot 50 DP 549457 & 1669-1723 Elizabeth Drive, Lot 100 DP 1283398

Dear Ellen,

Thank you for your referral dated 8 April 2024 seeking comment on the proposal from DPI Fisheries, a division of NSW Department of Primary Industries on the proposed works stated above. This notification complies with s.199(1)(a) of the *Fisheries Management Act 1994* (FM Act) concerning the proposed dredging and reclamation activities.



DPI Fisheries is responsible for ensuring that fish stocks are conserved and that there is no net loss of key fish habitats upon which they depend. To achieve this, DPI Fisheries ensures that developments comply with the requirements of the FM Act (namely the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A of the Act, respectively), and the associated *Policy and Guidelines for Fish Habitat Conservation and Management (2013)*. DPI Fisheries is also responsible for ensuring the sustainable management of commercial, recreational and Aboriginal cultural fishing, aquaculture, marine parks and aquatic reserves in NSW.

DPI Fisheries has reviewed the proposal in light of those provisions and has no objections to the proposed works, provided that:

Permits

1. As no marine vegetation is to be harmed in this proposal a section 205 permit under Part 7 of the FM Act is not required.
2. Under s.219(5)(a) any work that is permitted under the FM Act turns off the requirement for a section 219 permit to block fish passage so a section 219 permit is not required for this project.

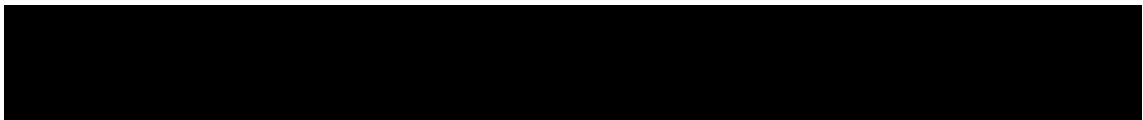
Project Design



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3. DPI Fisheries does not support the use of gabion baskets, they have little fish habitat value and may fail over time leading to impacts downstream. It is recommended that the gabion basket walls are removed from the design of the headwall structure. 'Soft-engineering' options (e.g. revegetation) should be implemented along riverbanks wherever feasible, where harder engineering options are required, an integrated approach using planting in combination with natural materials (logs, live stakes, live brush bundles etc.) is preferred.
 4. The headwall structure should be located in straight reaches of Wianamatta South Creek where no active bed or bank erosion or sediment build up is occurring.

Review of Environmental Factors Considerations

5. The environmental assessment should address the cumulative impacts on water quality and quantity including the management of stormwater, potential Acid Sulfate Soil and salinity issues, groundwater and land contamination, water volumes and flow velocities. The proposal should achieve 'no net impact' on Wianamatta South Creek from water quality and quantity and flow velocity.

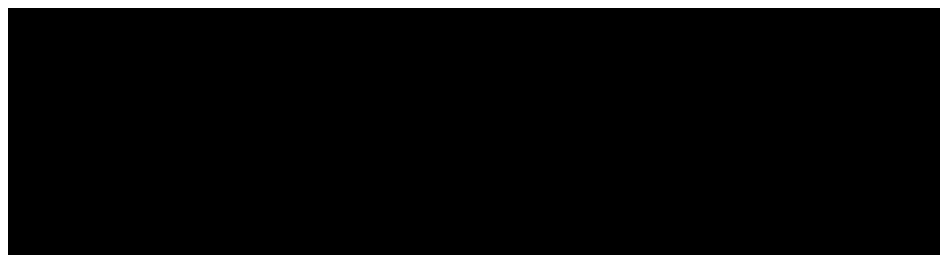
General Mitigation Measures

6. 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;
 7. Any material removed from the waterway that is to be temporarily deposited or stockpiles on land is to be located well away from the waterway and to be contained by appropriate sediment control devices; and
 8. DPI Fisheries (1800 043 536) and the Environment Protection Authority (131 555) is to be notified immediately if any fish kills occur in the vicinity of the works. In such cases, all works other than emergency response procedures are to cease until the issue is rectified and approval is given by DPI Fisheries and/or the Environment Protection authority for the works to proceed.
 9. Works are to be undertaken during low flows in the waterway;
 10. On completion of the works the site is to be rehabilitated and stabilised including but not limited to:
 - a. Surplus construction materials and temporary structures (other than silt fences and other erosion and sediment control devices) installed during the course of the works are to be removed.
 - b. Replanting the disturbed area with native endemic riparian vegetation.
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- c. Appropriate maintenance of erosion and sediment control devices is to be undertaken until the vegetation has successfully established and the site has stabilised.

Trenching

- 11. The width of the trench through the bank is minimised as far as is practical to conduct the works.
- 12. The trenched area within the key fish habitat below the top of the bank is to be infilled with the original sediment where possible.



Fisheries Manager, Coastal Systems

DPI Fisheries



RE: [External] RE: Sydney Water Thompsons Creek and South Creek Wastewater Project - DPI – Fisheries section 199 sta...



Tue 21/05/2024 9:47 AM

Expires 19/05/2032

Hi Jess,

Thank you for your email regarding our project.

Sydney Water acknowledges that the Department has no objections to the proposed works, provided that we meet the twelve requirements set out in your letter. With that in mind, the project team has been consulted and:

- 1 – 2 (Permits): we acknowledge that a section 205 permit and section 219 permit are not required.
- 3 – 4 (Project Design): we acknowledge that DPI Fisheries does not support the use of gabion baskets, and asks that the headwall structures be located in a straight section of the creek. Our project team has advised that, whilst the use of gabion walls is a common approach and often shown in design guidelines, the design can be adjusted in the project's detailed design phase to address the Departments request for 'soft engineering' options instead. Similarly, the final location of the headwall structure can take into consideration the Departments request during detail design phases.
- 5 (REF Considerations):
 - The environmental assessment/REF addresses the potential for cumulative impacts and the matters identified by DPI Fisheries. Regarding impacts to water quality and quantity, and to Wianamatta South Creek, the network and pump stations are designed to store a quantity of wastewater during wet weather events, preventing wastewater discharges most of the time. During extreme weather events, the wastewater storage capacity of the network and pump station may be exceeded, and untreated wastewater can flow from the overflow points. Wastewater system design requires overflow points as a contingency, so wastewater does not back up into houses and businesses if pipeline capacity is exceeded. This is a standard global approach to wastewater system design and Sydney Water also aligns with relevant Water Services Association of Australia (WSAA) codes and standards. During these overflow events, wastewater would have the potential to impact South Creek, potentially 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 new infrastructure has been designed for a maximum of 10 spill events in 10 years with overflow infrastructure only provided at pumping stations and not along the pipeline network. The new infrastructure will be designed and operated to comply with an environment protection licence (EPL) which would be issued to Sydney Water by the NSW EPA, and there are Ministerial Conditions of Approval for the Advanced Water Recycling Centre at Upper South Creek that also directly relate to the operation of the network.
- 6 – 10 (General Mitigation Measures): we agree to add these general mitigation measures.
- 11 – 12 (Trenching): we agree to include these requests.

These requirements will be appended to the endorsed REF.

Thank you.
All the best,
Ellen.

Ellen Curtis (Pronoun: She/Her)
Environmental Scientist

Hi Ellen,

Thank you for your notification. DPIRD Fisheries suggests the following additional mitigation measures be included in the REF if they haven't been already –

- Prepare Drilling Fluid Management Plan, including measures to:
 - contain and monitor drilling fluids at entry/exit points,
 - identify and manage frac-outs.
- Include monitoring of the pressure of the drilling fluid to determine if there is a sudden decrease in pressure which indicates that a frac-out has occurred. Prepared and include contingency measures to be implemented to respond to a frac-out.
- Ensure all entry and exit pits are located outside of key fish habitat.

Thank you,

Jess

Jess Hyland (*she/her*)

Fisheries Manager

Coastal Systems | Fisheries

**Department of Primary Industries
and Regional Development**



Appendix E – Bradfield Authority Letter (previously WPCA)

OFFICIAL

Bradfield Development Authority



[Redacted]
Project Manager
Sydney Water

Re: Consultation regarding Thompsons Creek and South Creek Catchments Wastewater Network (Stage 1)

Dear Nitin,

Thank you for your consultation request under clause 2.15(2)(h) of *State Environmental Planning Policy (Transport and Infrastructure) 2021* on the proposed Thompsons Creek and South Creek Catchments Wastewater Network (Stage 1).

The Bradfield Development Authority (the Authority) has reviewed the provided information and is supportive of this program as the proposed works will enable the wastewater connection to Bradfield City Centre and the surrounding Aerotropolis Core Precinct, providing activation to the new city centre.

In prepared the Review of Environmental Factors (REF) for the proposed works, the Authority requests the following matters are addressed:

- Alignment with the Design and Delivery Framework for the Regional Park at Thompsons Creek

The Authority has recently led the coordination of the Design and Delivery Framework for the Regional Park at Thompsons Creek as identified in the Aerotropolis Precinct Plan. The Framework identifies a flexible future landscaping design for the regional park and considers the future management processes. Attached is the Framework for consideration in the detailed design of the proposed Activity.

- Connections to civil infrastructure, including regional basins, within Bradfield City Centre

The REF for the Activity should include the future connection from the proposed trunk main to the civil infrastructure within Bradfield. Continued consultation between Sydney Water and the Authority's Delivery team should be undertaken to ensure design alignment of the proposed works.

OFFICIAL

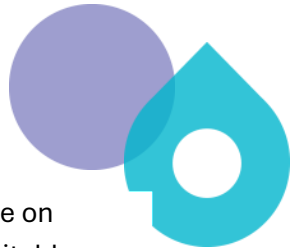

Bradfield Development Authority
50 Belmore Street
Penrith NSW 2750

T: 1800 312 999
E: hello@wpca.sydney
W: wpca.sydney

1

Sydney Water responded to the above two requests 5/11/2024, noting:

- The Design and Delivery Framework was provided to the project team for their consideration during design.
- Connections to civil infrastructure within Bradfield City Centre falls outside the scope of this project and REF. A follow up request for Sydney Water to continue to liaise with the Authority



was received 5/11/2024 with regards to this matter. Subsequent correspondence on 11/11/2024 confirmed Sydney Water Senior Project Manager, Will Watts, as a suitable contact moving forwards for the Authority Civils Delivery team lead (Tim Hutchinson) to liaise with, regarding future Bradfield City Centre requirements.



Appendix F – S.139(4) Fleurs Radio Telescope Site





Appendix G – Fleurs Radio Telescope Site: surveyed relics (CRM 2019)

CRM 2019, University of Sydney Western Sydney Lands: [Badgerys Creek Farm Centre, Elizabeth Drive, Badgerys Creek. Heritage Assessment](#)

Contractor is to refer to whole report, with special focus on surveyed items identified and described in:

- Appendix (survey results) Table 4 (pertaining to Area 7) and associated figure mapping survey locations.
- Appendix (survey results) Table 6 (pertaining to Area 9) and associated figure mapping survey locations.



Appendix H – Biodiversity Assessment Report (BAR)





Appendix I – Aboriginal Cultural Heritage Assessment Report

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 J – Noise mitigation measures – definition of recommendations

Table 8-1 Additional noise mitigation measures and description, taken from TfNSW noise estimator tool in relation to the assessment (section 6.2.5)

Abbreviation	Mitigation measure and description
N	Notification (letterbox drop or equivalent): Advance warning of works and potential disruptions can assist in reducing the impact on the community. The notification may consist of using variable message sign, letterbox drop (or equivalent), web site / social media or a combination to distribute information detailing work activities, time periods over which these will occur, impacts and mitigation measures. Notification should be a minimum of five working days prior to the start of works. The approval conditions for projects may also specify requirements for notification to the community about works that may impact on them.
SN	Specific notifications: Specific notifications are letterbox dropped (or equivalent) to identified stakeholders no later than five working days ahead of construction activities that are likely to exceed the noise objectives. The specific notification provides additional information when relevant and informative to more highly affected receivers than covered in general letterbox drops. This form of communication is used to support periodic notifications, or to advertise unscheduled works.
PC	Phone calls: Phone calls detailing relevant information made to identified/affected stakeholders, who have provided their contact details, within seven calendar days of construction start. Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposal and specific needs. Where the resident cannot be telephoned then an alternative form of engagement should be used.
RO	Respite offer: Respite Offers should be considered where there are high noise and vibration generating activities near receivers. As a guide work should be carried out in continuous blocks that do not exceed 3 hours each, with a minimum respite period of one hour between each block. The actual duration of each block of work and respite should be flexible to accommodate the usage of and amenity at nearby receivers. The purpose of such an offer is to provide residents with respite from an ongoing impact. This measure is evaluated on a project-by-project basis, and may not be applicable to all projects, or when duration respite has been agreed (see below)
R1	Respite Period 1: Out of hours construction noise in out of hours period 1 shall be limited to no more than three consecutive evenings per week except where there is a Duration Respite. For night work these periods of work should be separated by not less than one week and no more than 6 evenings per month
R2	Respite Period 2: Night time construction noise in out of hours period 2 shall be limited to two consecutive nights except for where there is a Duration Respite. For night work these periods of work should be separated by not less than one week and 6 nights per month. Where possible, high noise generating works shall be completed before 11pm.
DR	Duration respite: Respite offers and respite periods 1 and 2 may be counterproductive in reducing the impact on the community for longer duration projects. In this instance and where it can be strongly justified it may be beneficial to increase the work duration, number of evenings or nights worked through Duration Respite so that the project can be completed more quickly. RDC staff should engage with the community where noise levels are expected to exceed the NML to demonstrate support for Duration Respite.
AA	Alternative accommodation: Alternative accommodation options may be offered (as a last resort) to residents living in close proximity to construction works (within the distance nominated by the noise estimator) that are likely to experience highly intrusive noise levels.

