



Review of Environmental Factors

North West Growth Area Package 4A-Project 2
(May 2022)

Sydney
WATER

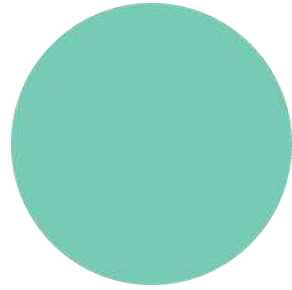
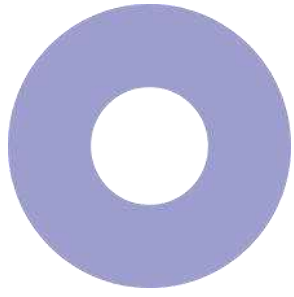




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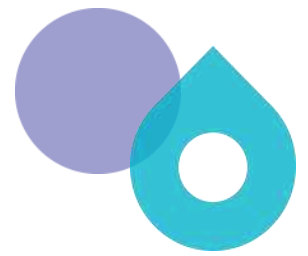


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Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of North West Growth Area Package 4A – Project 2 and 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 State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP) allows the proposal to be carried out without development consent. The proposal has also been considered against the matters listed in subsection 171 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) (Appendix A).

During construction, the main potential environmental impacts of the proposal are typical temporary construction impacts such as erosion and sediment, vegetation removal, aboriginal heritage and noise. During operation, the main impacts are associated with visual amenity. The assessment shows that if we adopt the measures identified in this REF, the proposal would not have a significant environmental impact. Accordingly, we do not require an Environmental Impact Statement (EIS).

The Sydney Water Project Manager is accountable to ensure the proposal is carried out as described in this REF. If the scope of work or work methods described in this REF change significantly following determination, additional environmental impact assessment may be required.

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1 Introduction

1.1 Context

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

We are a statutory State-owned corporation and are classified as a public authority, and a determining authority for the proposed work under Division 5.1 of the EP&A Act. This REF assesses the potential environmental impacts associated with our proposal, the North West Growth Area (NWGA) Package 4A – Project 2, and identifies safeguards that avoid or minimise potential impacts.

1.2 Proposal background and need

1.2.1 Proposal background

Development in the NWGA is rapidly expanding with an additional 34,000 homes to be built over the next 6 years. A total of 65,000 dwellings are expected by 2026. Two packages of works are required to service the community's wastewater needs as it grows:

- Package 4A will enable wastewater servicing of approximately 26,000 dwellings to meet growth up to 2024
- Package 4B will enable servicing of remaining growth up to 2026.

Package 4A has been divided into three projects for staged delivery. Project 1 was identified for urgent delivery by 2022 and was the subject of an REF (approved July 2021) and Addendum (approved December 2021). This REF assesses Package 4A, Project 2. Project 3 will be assessed for delivery at a later stage.

A summary of the proposal need, objectives and consideration of alternatives are provided in Table 1 below.

Table 1. Proposal need, objectives and consideration of alternatives

Aspect	Relevance to proposal
Proposal need	The proposal is part of the NWGA Package 4A program. This proposal forms an essential part of the program to enable wastewater servicing to the community as it grows to year 2024. This proposal is required to meet Sydney Water's operating licence obligations. The proposal would connect to the Riverstone Wastewater Treatment (WWTP) plant and associated sewage



treatment system operating under Environment Protection Licence (EPL) 1796.

Proposal objectives

The proposal objectives are to:

- optimise delivery of wastewater servicing in the NWGA through staged delivery
- support sustainable development of the area through a reliable wastewater service
- minimise impacts to the surrounding environment and community.

Consideration of alternatives/options

An options assessment determined the preferred option by using a least cost with acceptable risk framework.

Shortlisted options were based on lifecycle costs and non-costs benefits and risks, agreed by stakeholders. Non-cost evaluation criteria included resilience and reliability, constructability, customer and community impact, environmental constraints, flexibility and adaptability to growth and system configurations and operations and maintenance requirements.



1.3 Consideration of Ecologically Sustainable Development

The proposal has been considered against the principles of ecologically sustainable development (ESD) (refer to **Table 2** below)

Table 2. Consideration of principles of ecologically sustainable development (ESD)

Principle	Consideration in proposal
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>The proposal will not result in serious or irreversible environmental damage and there is no scientific uncertainty relating to the proposal.</p> <p>The potential environmental impacts of the project have been considered to avoid serious or irreversible damage to the environment, and are assessed in Section 5 of this REF. The environmental impacts of construction will be minor, localised and short-term.</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>The proposal will help to meet the needs of future generations by providing a reliable wastewater service.</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>The proposal includes the removal of 1.01 ha of native vegetation (Section 5.3). The proposal has minimised impacts to biological diversity or impact ecological integrity by limiting vegetation to be cleared. The proposal will not significantly impact ecological communities. Vegetation removed will be revegetated or offset according to Sydney Water’s Biodiversity Offset Guide.</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>The proposal will provide cost efficient use of resources and provide optimum outcomes for the community and environment and with respect to financial cost.</p>

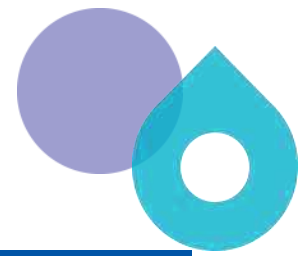
2 Proposal description

2.1 Proposal details

Table 3 identifies the scope of work for the proposal and Figure 1 shows the location.

Table 3. Description of proposal

Scope of work	Detailed description of work/ activity
Proposal description	<p>Proposal summary:</p> <p>The proposal is for a new pump station (SP1232), two new cross connected wastewater pipelines (WW02 and WW03) and one new emergency generator to be located at existing pump station SP1154. The proposal will service the commercial and residential zoned land within the Marsden Park North precinct.</p> <p>WW02 and WW03 will be installed in the same trench, using open trenching methods (about 1.5 to 4.2 m below ground) along existing roads. Both pipelines will be horizontal directional drilled (HDD) under Eastern Creek (deepest point about 18.7 m below ground) for approximately 284 m. WW02 and WW03 will connect flows to the inlet works at Riverstone WWTP.</p> <p>Proposal detail:</p> <p>SP1232 – new pump station:</p> <ul style="list-style-type: none">• wet well - 4.5 m diameter and 15.5 m deep with storage capacity of 148 kilolitres (kL), containing submerged pumps (two duty and one standby)• emergency storage structure – 440 kL storage capacity or approximately four hours, which allows sufficient time to respond and rectify failure• inlet maintenance hole (IMH) and valve chamber• vent shaft – 18 m high (DN300), venting the wet well, emergency storage structure and IMH• switchroom• emergency generator• pad mounted substation• hardstand for diesel pumps• chemical dosing unit (CDU) building with bunded truck unloading area• overflow main (DN750) and emergency relief system (ERS) discharging to an existing farm dam at the end of an ephemeral tributary• external lighting, security fencing, barriers, bollards and signage, toilet, access road (minimum 4 m wide), parking bays



Scope of work	Detailed description of work/ activity
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SP1232 will provide rooftop capacity for future solar PV installation options.

WW02 – new wastewater pipeline:

- polyethylene (PE) pressure main approximately 5.2 km long (DN560), extending from the existing capped main at the corner of Richmond Road and Garfield Road to Riverstone WWTP.

WW03 – new wastewater pipeline:

- PE pressure main approximately 2 km long (DN560), between Riverstone WWTP and SP1232 with cross connections to WW02 (upstream and downstream of the HDD section).

Cross connections with WW02 enables redundancy in the event of a pressure main failure in the HDD section.

SP1154 – permanent emergency generator:

- enclosed permanent generator to be located on existing slab at existing pump station site SP1154
- external fuel tank with fuel capacity for 224 hours of continuous operation (4000L) with external protective bollards.

The permanent generator will be installed prior to the upgrade of pump station SP1154 (expected by 2026) and will be sized for future peak wet weather flows (PWWF) assessed as 706 L/s. The emergency generator does not operate unless it is required (i.e. in an emergency where there is a loss of power to SP1154).

Location and land ownership

SP1232 is located in Lot 1 DP57249 in the suburb of Marsden Park. The land is currently owned by Marsden Park North (MPN) developers and is within the future Marsden Park North development site. Sydney Water intends to acquire the land on which the pumping station will operate.

WW02 is located north of the corner of Richmond Road and Garfield Road West and along Park Road in the suburb of Marsden Park. It continues under Eastern Creek in the suburb of Riverstone and joins into Riverstone WWTP located in the suburb of Vineyard. The pipeline is located in private and public lands and easements will be acquired over private land.

WW03 linking SP1232 is located in Marsden Park. It follows the WW02 alignment to the north in Riverstone and Vineyard. The pipeline is located in private and public lands and easements will be acquired over private land.

The permanent emergency generator at SP1154 is located in Lot 401 DP1180386 in the suburb of Vineyard, north west of Riverstone WWTP and Windsor Road intersection with Bandon Road. The land is owned by Sydney Water.



Scope of work	Detailed description of work/ activity
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All proposed assets are located in Blacktown local government area (LGA) except for the proposed emergency generator at SP1154 which is located in Hawkesbury LGA.

All proposed assets are located within the north west growth centre. SP1232 and sections of WW02 and WW03 are located within the Marsden Park North growth centre precinct. North west of Eastern Creek, WW02 and WW03 are located within the Riverstone growth centre precinct. The permanent emergency generator at SP1154 is located in the Vineyard growth centre precinct.

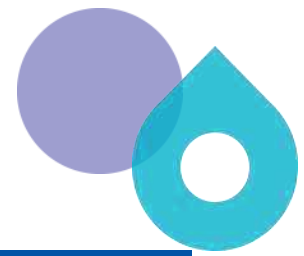
Pre-construction work and site establishment

Pre-construction activities include:

- surveying including potholing to identify existing services and confirmation of property lines, easements, future road boundaries and future services
- conducting geotechnical or contamination investigations including groundwater monitoring wells, soil sampling and locating existing underground services
- preparing management plans and procedures including a Construction Environmental Management Plan (CEMP)
- liaising with local authorities and local residents to notify and discuss the works in accordance with Sydney Water’s community relations protocols
- establishing and marking out the designated construction areas including compound areas for amenities, material laydown and temporary machinery storage
- setting up temporary construction compounds including site sheds and amenities including providing these with temporary water and electricity services
- establishing signage informing temporary footpath diversions and lane closures (if required)
- setting up traffic controls
- establishing erosion and sediment controls
- vegetation clearance
- delivering and storing materials and equipment.

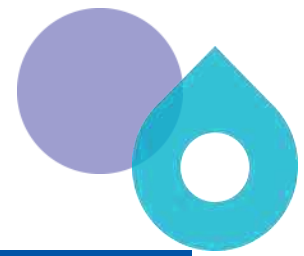
Ancillary facilities (compounds) and access tracks

Construction compounds will be required to house site sheds, construction amenities and materials laydown. The exact location of these will be chosen by the Contractor and remain within the field assessment area, in consultation with the landowner(s) and approved by Sydney Water’s Project Manager as described in the safeguards in Section 5. Compound locations will be in previously disturbed areas avoiding the need for vegetation clearance.



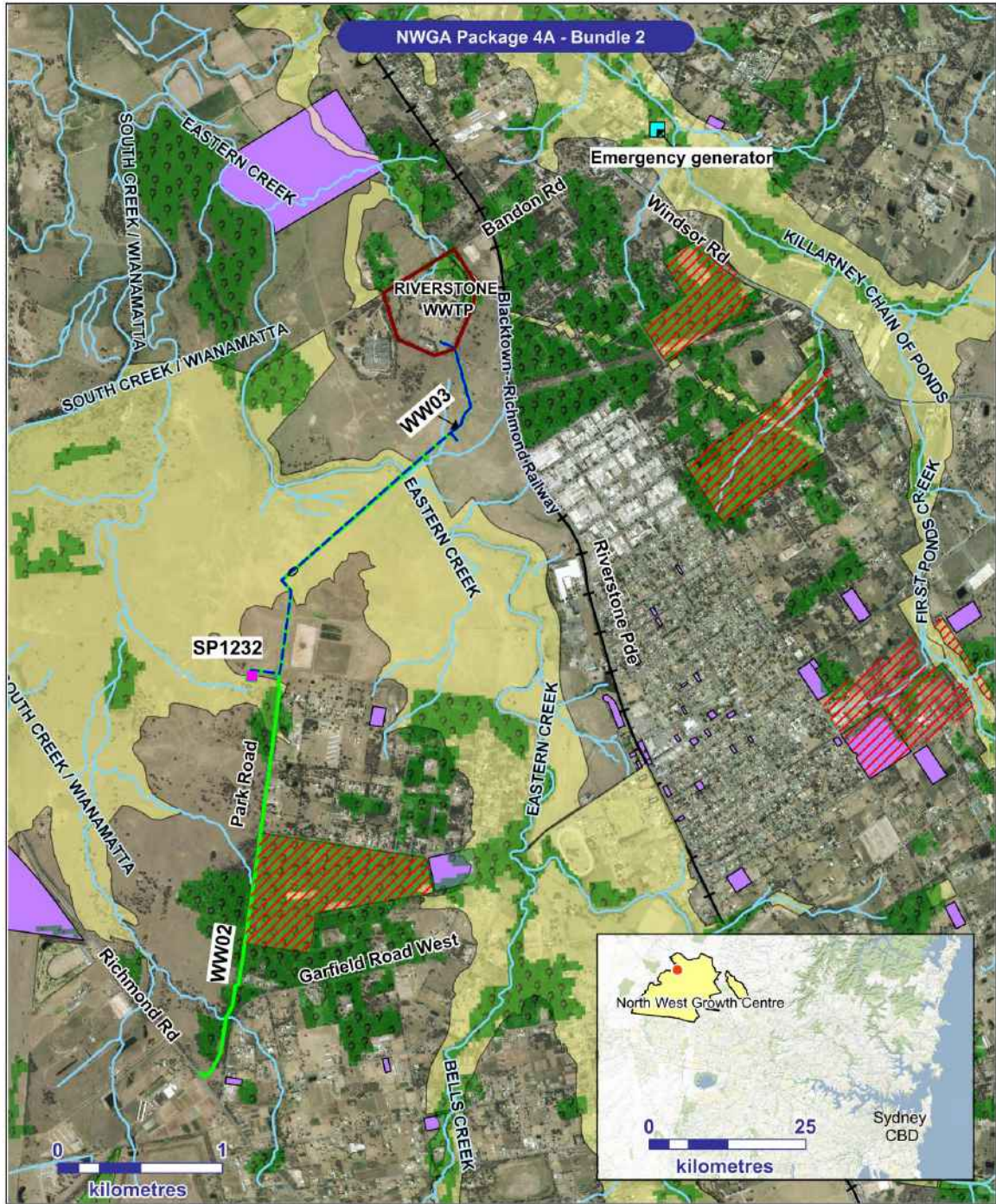
Scope of work	Detailed description of work/ activity
Construction methods	<p>Civil works will include excavation and backfilling for the proposed assets. For WW02 and WW03 this will be contained within a 20 m construction corridor width. Approximately 284 m will be constructed by HDD under Eastern Creek for both WW02 and WW03.</p> <p>Groundwater extraction during the construction of the SP1232 will be required.</p>
Commissioning	<p>Commissioning involves testing and running the new equipment to ensure the equipment is working correctly and integrated with existing network operations. The exact commissioning steps depend on the type of the equipment, but typically include:</p> <ul style="list-style-type: none"> • preparing and testing new infrastructure which may include pressure leak tests, checking of all equipment and safety devices • performance testing including sampling where required • providing site labelling • operator training and preparing maintenance manuals.
Restoration	<p>The work site will be restored to the pre-existing condition following construction in consultation with landowners. This includes reinstating damaged roadways or footpaths and replanting trees. Native vegetation removed during construction will be offset (refer to Section 5.2.3 for details).</p>
Materials/ equipment	<p>Materials:</p> <ul style="list-style-type: none"> • concrete, structural steel, aluminum, timber and steel reinforcement • PE pipes • bentonite-based drilling fluid • electrical cabling and conduits • mechanical and electrical equipment • granular material, road base, asphalt, rock rip-rap, engineered backfill and concrete including for restoration purposes • asphalt for sealing roads • fuel for equipment, machinery and vehicles • a range of fixtures and fitting such as valves <p>Equipment:</p> <ul style="list-style-type: none"> • light and heavy vehicles • concrete trucks and pumps • vacuum trucks • PE pipes, valves and fixtures • welding equipment, grinders





Scope of work	Detailed description of work/ activity
	<ul style="list-style-type: none"> • excavators • graders, compactors, rollers • hydraulic winch • mobile cranes • pavement saws • generators • jack hammers • HDD machine • water cart and pump • shoring boxes • painting and coating equipment • temporary fencing, skip bins, environmental controls and portable amenities • hand tools • access platforms (fixed and mobile) and scaffolding.
Work hours	<p>Work and deliveries will be scheduled to occur during standard daytime hours:</p> <ul style="list-style-type: none"> • 7am to 6pm, Monday to Friday • 8am to 1pm, Saturdays <p>The proposal is not expected to require work outside these hours. Sometimes work is required at different times (eg. for work in roads or delivery of oversize equipment). Sydney Water’s Project Manager can approve work outside of standard daytime hours, following the approval process described in the safeguards in Section 5.</p>
Workforce	<p>The peak number of personnel on site may be up to 30 staff.</p>
Proposal timing	<p>Surveys and investigations are expected to commence by mid 2022. Construction of assets will commence around mid 2023 and construction completion is anticipated for mid 2025.</p>
Operational requirements	<p>The system will be monitored remotely. Operational crews may need to respond or attend site where monitors indicate system performance checks are required. The system will form part of the Riverstone Sewage Treatment system operating under EPL 1796. No changes to the EPL are required.</p>





- Legend**
- Proposed WW02
 - - - Proposed WW03
 - Proposed pumping station (SP1232)
 - Proposed emergency generator (existing SP1154)
 - Riverstone WWTP
 - Existing Non Certified Land
 - NO GO ZONE: Growth Centres Biodiversity Certification Order - Condition 12 vegetation
 - Local heritage (non-aboriginal)
 - Groundwater dependent ecosystem
 - Waterway
 - Railway Line

Sydney WATER

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 NSW Department of Planning, Industry & Environment
 NSW Spatial Services
 Australian Government Department of Environment
 Nearmap
 Date Created: 11/05/2022

Figure 1. Location of proposal and environmental constraints (refer Section 5 – other constraints)



2.2 Field assessment area and changes to the scope of work

The proposal assessed in this REF includes construction, commissioning and operation activities as described above. The impact area is indicative and based on the latest concept design at the time of REF preparation. For the pipelines, this includes an excavation area of a 1 m wide trench within a 20 m wide construction corridor. An assessment corridor of 30 m was adopted to allow for flexibility during detailed design. Launch and exit pits for HDD under Eastern Creek would measure 10 m x 10 m.

The final design and pipeline alignments may change based on detailed design and/ or construction planning. If the design/scope of work, construction methods or construction timing described in this document change significantly, supplementary environmental impact assessment must be prepared for the amended components in accordance with SWEMS0019. An addendum is not required provided the change:

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

Changes to the proposal outside the assessment area 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.



3 Consultation

3.1 Community and stakeholder consultation

Our approach to community and stakeholder consultation is guided by the Guidelines for Community and Stakeholder Engagement (Sydney Water, 2021).

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, projects 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.

If our work will impact the community in some way, we will consult with affected groups through a variety of ways and through different stages of a project. 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, regardless of the need for development consent. Local council(s) will be consulted about matters identified in environmental planning instruments (refer Section 4.2 below), including public safety issues, the placement of any temporary site sheds or laydown areas on council land, or full or partial road closures of council managed roadways.

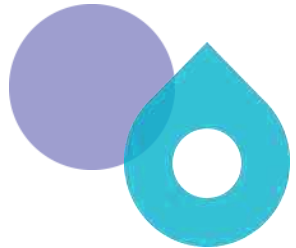

Consultation has occurred and will continue with Marsden Park Precinct developers regarding land acquisition and co-ordinated staging of construction.

Discussions have occurred with Blacktown City Council and TfNSW on future roads and development for the area.

3.2 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 agency's infrastructure or land (specified in Part 2.2 Division 1 of the TISEPP (Appendix B)).

Consultation with Blacktown City Council (BCC) is required under s2.1 of the TISEPP as more than minor excavations of local footpaths and roads will be required. BCC has been consulted about the proposal and has provided input on future developments and major infrastructure initiatives for the area. Our Contractors and Sydney Water staff will continue to consult throughout



project design, construction and operation. This will ensure that the community remain informed and that we understand their issues and concerns.

The Contractor, in consultation with Sydney Water, will keep the community informed throughout construction as well as manage issues and complaints. After commissioning, our standard policies and procedures for customer and community relations will apply.

During construction, the Contractor responsible for delivering the proposal will consult with stakeholders and the community and, as representatives of Sydney Water, will adhere to our community relations policies and procedures. We will continually monitor the Contractor's performance during proposal delivery.

The NSW State Emergency Service (SES) was consulted under s2.13 of the TISEPP as SP1232 is located on flood liable land. The SES has encouraged Sydney Water to:

- consider the impact of flooding on the infrastructure including relocating the site above the 1% AEP flood level to minimise flood impacts on the pump station and community including loss of services and potential contamination risk
- pursue, if relevant, site design and stormwater management that minimises any risk to the community
- ensure people using the the site are aware of the flood risk during and after the works, for example by using signage
- develop an appropriate business emergency plan to assist in being prepared for, responding to and recovering from flooding.

The land currently is owned by a Precinct developer and is planned for acquisition by Sydney Water. The developer plans to fill the area at SP1232, prior to its development for the pump station. SP1232 will be located above the 1% AEP flood level including the electrical switch room and emergency generator. Emergency overflows will discharge to an existing farm dam. Section 5.2 provides safeguards in consideration of recommendations received from SES.

NSW Fisheries has been notified under s199 of the *Fisheries Management Act 1994* as the proposal involves dredging (as defined in the Act) under Eastern Creek which is classified as Key Fish Habitat. NSW Fisheries have raised no objections to the proposal provided environmental mitigation measures in the REF are implemented on site.

Consultation with Precinct developers and Transgrid has occurred and will continue regarding easements and construction within Transgrid easements, required for WW02 and WW03.

4 Legislative requirements

4.1 Environmental Planning and Assessment Act

The following environmental planning instruments (Table 4) and legislation (Table 5) are relevant. Table 5 also documents any licences and permits, timing and responsibility for obtaining them.

Table 4. Consideration of environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Blacktown City Council Local Environmental Plan 2015	The proposal is located on land zoned: <ul style="list-style-type: none">• RU4 - Primary Production Small Lots• C2 - Environmental Conservation (Eastern Creek)• RE – Private Recreation• IN1 – General Industrial• SP2 – Infrastructure.
Hawkesbury City Council	The emergency generator is located on land zoned: <ul style="list-style-type: none">• SP2 Infrastructure.
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Section 2.126 of the TISEPP permits development by or on behalf of a public authority ('prescribed circumstances') for sewage reticulation systems without consent on any land. As Sydney Water is a public authority, the proposal is permissible without consent.
SEPP (Biodiversity and Conservation) 2021	Vegetation in non-rural areas (Chapter 2) Chapter 2 of this SEPP applies as it 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> ' As the works are permissible under the TISEPP a Council permit to clear vegetation under this SEPP is not required. Bushland in urban areas (Chapter 6) Chapter 6 of this SEPP applies as the proposal is on land listed in Schedule 5 of the SEPP. As a public authority, Sydney Water has had regard to the aims and objectives of the SEPP to protect and preserve bushland within urban areas (Section 5.3 of the REF).

Hawkesbury-Nepean River (Chapter 9)

Chapter 9 of this SEPP applies as the proposal is on land mapped under s9.1. Sydney Water has taken into consideration, the requirements of s9.4 and s9.4.

SEPP (Resilience and Hazards) 2021

Remediation of Land (Chapter 4)

Land contamination and the potential need for remediation was considered for the proposal (Section 5.1 of the REF).

SEPP (Precincts - Central River City) 2021

The proposal is located within both 'certified' and 'non-certified land' in the north west growth centre.

Offsets are not required for vegetation removal in certified lands. However, clause 7 and 8 of the Biodiversity Certification Order for Growth Centres requires offsets at a ratio of 3:1 if clearing ENV within non-certified areas. No ENV within non-certified areas is proposed to be removed (Section 5.3 of the REF).

4.2 Other legislation

Table 5. Consideration of key environmental legislation

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
<i>Environmental Planning and Assessment (EP&A) Act 1979</i>	Sydney Water is the proponent and determining authority under this 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.	REF	Pre-construction, Sydney Water
<i>Protection of the Environment Operations (POEO) Act 1997</i>	No new scheduled activities are proposed. The proposal will form part of the sewage reticulation system associated with Riverstone WWTP and therefore will operate under existing EPL 1796. Pump station SP1232 has been designed to meet the EPL requirement of no dry weather overflows.	N/A	N/A

<i>Biodiversity Conservation (BC) Act 2016</i>	Clearing of threatened ecological communities (TEC) will be required for the proposal. A test of significance was completed (Section 5.2.3) and found that the proposal is unlikely to have a significant impact and a Species Impact Statement is not required.	N/A	N/A
<i>National Parks and Wildlife (NPW) Act 1974</i>	There will be direct impacts on known Aboriginal archaeological sites. An Aboriginal cultural heritage assessment was conducted and concluded that an Aboriginal Heritage Impact Permit (AHIP) is required.	AHIP	Post REF, pre-construction, Sydney Water
<i>Fisheries Management (FM) Act 1994</i>	Eastern Creek is a key fish habitat that will be underbored for the proposal. The design avoids blocking or impeding fish passage but is defined as dredging under the Act. NSW Fisheries has been notified under s199 and no objections to the proposal have been raised.	Notification	Pre-construction, Sydney Water
<i>Water Act 1912/ Water Management Act 2000</i>	Preliminary information indicates that groundwater will need to be dewatered for the proposal. It is unlikely that more than 3 ML/yr will be dewatered. A Water Access Licence (WAL) will not be required. However, a Water Supply Works Approval (WSWA) will be required. Extraction volumes will be confirmed during detailed design.	WSWA	Pre-construction, Contractor
<i>Roads Act 1993</i>	Ground excavation will be required within 100m of traffic signals and a state road, Richmond Road. Local roads may require temporary lane closures. A road occupancy licence (ROL) will be required.	Road Occupancy Licence	Pre-construction, Contractor
<i>Environment Protection and Biodiversity Conservation (EPBC) Act 1999</i>	The proposal is not on Commonwealth land and will not impact matters of national environmental significance. The proposal will impact Cumberland Plain Woodland listed under the EPBC Act. However, there will not be a significant impact on the community (Section 5.3 of the REF). Referral to the Commonwealth Department is therefore not required.	N/A	N/A



5 Environmental assessment

The potential environmental aspects and impacts associated with construction and operation of the proposal are identified below as well as safeguards to minimise these. These safeguards will be incorporated into contract documents and a Construction Environmental Management Plan to be developed by the Contractor prior to commencement of work.

Risk assessments are undertaken by the Project Manager following Sydney Water's [Risk Management Framework throughout the life of the project](#).

5.1 Topography, geology and soils

Existing environmental

The proposal:

- is largely in a disturbed landscape characterised by rural paddocks
- is in an area underlain by alluvium silts and clays (particularly near Eastern Creek and SP1154), residual clays and Bringelly Shale or St Mary's formation bedrock comprising laminate, siltstone, claystone and shale (Sydney Water, 2021a)
- is in an area of localised highly dispersible and erodible soils
- is in an area mapped as a localised salinity hazard.

It is noted that the emergency generator at SP1154 will be located on existing hardstand.

The proposal:

- is not located near any contaminated sites notified to the EPA and the potential for contaminants of potential concern at levels above relevant screening criteria is low to moderate (Aurecon Arup, 2021)
- is not in an area known to be impacted by acid sulfate soils (ASS)
- is not in a mine subsidence zone and is not impacted by an existing exploration or mining title.

Ground levels generally slope down from Richmond Road (about 28m RL), reaching ~18 m RL at SP1232, and ~ 5m or 6m RL towards Eastern Creek. Ground levels increase from Eastern Creek towards Riverstone WWTP (~ 30m to 35 m RL). The emergency generator will be located on formed hardstand, below 20 m AHD.

Potential impacts

During construction, we will excavate and stockpile soils. Excavation depths vary between about 1.3 m and 4.5 m depth for trenched pipeline sections. At SP1232, wet well construction will require excavations to 16 m deep with shale in this location anticipated between 3-6 m bgl (Sydney Water, 2021a).

Excavations will disturb localised areas of highly erodible and dispersive soils susceptible to erosion and which have poor water drainage when set (dried). Excavations within alluvial deposits may encounter soft, compressible soil, also susceptible to erosion. Due to general historical filling

and illegal dumping in the rural area, there is the potential to encounter unexpected contamination (refer to Section 5.7 for soil re-use and disposal).

Inappropriate management during soil movement has the potential to result in offsite erosion and sedimentation onto surrounding land and waterways including leaching from saline soils.

Filling will be required at SP1232. However, this is a small area (about 0.24 ha) and except for SP1232, the general topography and drainage patterns will not permanently change. Filling at SP1232 is proposed to be undertaken by the developer prior to Sydney Water commencing construction and will be subject to separate agreement with Sydney Water.

No further impacts would occur during operation of the proposal.

Safeguards

Prevent sediment moving offsite in accordance with Managing Urban Stormwater, Soils and Construction, Volume 1 and 2A (Landcom 2004 and DECC 2008), including:

- divert surface runoff away from disturbed soil and stockpiles
- install sediment and erosion controls before construction starts
- reuse topsoil where possible and stockpile separately
- inspect controls at least weekly and immediately after rainfall
- rectify damaged controls immediately
- remove controls once surfaces have been stabilised, including removing trapped sediment in drainage lines.

Minimise ground disturbance and stabilise disturbed areas progressively.

Contractor to ensure imported material is certified for intended use and is free from contamination including asbestos.

The CEMP will incorporate an unexpected finds protocol for contamination. This includes stopping work in the immediate vicinity of suspected contamination. Indicators of contamination include discoloured soil, anthropogenic fill material, asbestos, strong chemical or petrol odours and leachate. Contain disturbed material on an impermeable surface and cordon areas off. Notify the Sydney Water Project Manager and the Environmental Representative.

Sydney Water Project Manager to contact Property Environmental Services for advice regarding management options.

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.

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.

5.2 Water and drainage

Existing environment

Our proposal is located:

- under Eastern Creek which is key fish habitat and a tributary of South Creek, where WW02 and WW03 will be underbored. This location is upstream of the tidal reach of Eastern Creek defined by a weir about 1.4 km downstream of the HDD section
- adjacent to an unnamed tributary of South Creek, joining a farm dam into which SP1232 overflow main will discharge
- partially in a 1% AEP flood area within the Hawkesbury Nepean valley floodplain. The proposal has considered the impact of flooding and has designed SP1232 to be constructed above the 1% AEP flood level including the switchroom and emergency generator.
- in an area with limited desktop groundwater information. Available measured water levels from existing monitoring bores in the area indicates groundwater observed at:
 - 3.3 m bgl (~5.5m AHD) 200m from Eastern Creek
 - 7.8 m bgl (~26 m AHD) at Riverstone WWTP
 - 9.4 m bgl (~3.1 m AHD) 4.5 km west of WW02 near the intersection of Garfield Road west and railway line.

Groundwater levels are expected to fluctuate seasonally

- in an area with terrestrial groundwater dependent ecosystems (GDEs) (Figure 1):
 - along WW02 comprising of plant community type (PCT) 849 Cumberland Plain Woodland (medium and low ecological value GDE¹)
 - at Eastern Creek comprising of PCT 1800 Swamp Oak open forest (medium ecological value GDE)
- in an area where significant groundwater management is not expected as soils are expected to be fine-grained, of low permeability and low hydraulic conductivity.



Potential impacts

During construction, HDD under Eastern Creek has the potential for frac outs if inappropriately managed. Sydney Water has notified the Department of Primary Industries in accordance with s.199 of the *Fisheries Management Act 1994*. Provided the safeguards below are implemented, NSW Fisheries had no objections to the proposal.

Waterlogging, ponding and scouring may occur due to poor soil drainage, and flooding has the potential to increase movement of spoil offsite during construction.

Temporary extraction of groundwater during construction of the wet well for SP1232 may be required. Geotechnical investigations will be completed during detailed design to confirm the

¹ Ecological values for high probability GDEs are based on the High Ecological Value Aquatic Ecosystem (HEVAE) framework.



potential for groundwater extraction and estimate the quantities likely to be intercepted during construction. Soils and rock are anticipated to have low permeability and hydraulic conductivity. If encountered along trenched sections of the pipeline, groundwater extraction during construction is expected to be minimal.

A review of GDEs and potential impacts was conducted by ecology and heritage consultants, Biosis on 20 May 2022. Potential impacts to GDEs may occur such as through temporary extraction of groundwater during construction and through lateral migration along pipeline backfill material. Biosis indicated that potential impacts to GDEs would most likely occur during the construction phase of the project and be temporary in nature and localised. It is expected that implementing the safeguards below will reduce the potential of undue groundwater loss that could have the potential to cause a higher level of impact to the GDEs. The implementation of these measures will enable impacts to be managed so that ongoing negative pressures on the retained vegetation is unlikely. Assuming any potential negative interactions with groundwater are confined to being temporary and localised in nature, there are not expected to be any substantial or significant impacts to GDEs as a result of the project.

During operation, there is the potential for failures/breaks in the reticulation system. However, WW02 and WW03 are cross connected, providing redundancy in the event of a failure. The reticulation system including pump station is monitored remotely. SP1232 has been designed to include four hours of emergency storage providing sufficient time to respond and rectify a potential failure. SP1232 includes an overflow line however, the pump station is designed not to overflow in dry weather. The emergency generator at SP1154 addresses the risk of a potential power outage at SP1154.

Operations at SP1232 will require chemical truck deliveries. The CDU is designed with adequate bunding in the event of a spill.

SP1232 does not require any personnel/ operators on the site, however as it is located within a flood risk area (the site including switchroom and emergency generator will be located above the 1% AEP flood level), the safeguards below incorporate flood risk awareness and response provisions.

Safeguards

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

- geotechnical and constructability issues (eg 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.

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

Prepare Drilling Fluid Management plan to avoid impacts, including:

- contain and monitor drilling fluids at entry/exit points
- identify and manage frac-outs
- re-use and/or disposal of drilling fluids (checking waste classification).

Use appropriate controls to avoid potential sedimentation to waterbodies (eg floatation boom).

Adopt drainage control measures during construction to prevent ponding and scouring.

Locate portable site amenities away from watercourses or drainage lines.

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 and/or 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.

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.

Minimise groundwater ingress during detailed design.

Sydney Water will obtain a groundwater Water Supply Approval. The Contractor is responsible for:

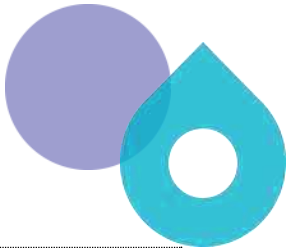

- providing expert hydrogeological technical information to obtain the approvals on time
- preparing a Dewatering Management Plan
- complying with the approval conditions (such as protecting water quality; minimising aquifer extraction volumes, monitoring and recording extracted volumes).

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

Discharge all water in accordance with Sydney Water's Discharge Protocols Standard Operating Procedure (WPIMS5021), including erosion controls, discharge rate, dechlorination, monitoring. Re-use potable / groundwater water where possible.

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.

Pending the results of geotechnical investigations including water levels, the trenched pipeline will incorporate design measures to reduce the potential for lateral migration of groundwater along pipeline backfill material (e.g. bulk heads fit for arresting lateral groundwater movement) at locations where the proposal intercepts GDEs (Figure 1).



Ensure users of the site are aware of the flood risk to the area. This may include installing signage at the site and/or incorporating flood risk awareness and emergency response and recovery procedures into induction documents and operational plans.

5.3 Flora and fauna

Existing environment

A flora and fauna assessment was prepared by Biosis (Biosis, 2022) (Appendix D). All proposed assets are located within the NWGA in either:

- certified land (not subject to the BC Act or EPBC Act), or
- non-certified land (subject to the BC Act, EPBC Act and Biodiversity Certification Order for SEPP (*Precincts – Central River City*) 2021

The study area (40 m wide corridor) intersected by WW02 and WW03 contains the following plant community types (PCTs):

- PCT 849 - Cumberland Plain Woodland
 - critically endangered ecological community (CEEC), EPBC Act and BC Act
- PCT 725 - Broad leaved Ironbark – *Melaleuca decora*
 - Does not satisfy thresholds for EPBC listing; EEC under the BC Act
- PCT 724 - Broad leaved Ironbark – Grey Box *Melaleuca decora*
 - CEEC under the EPBC Act and ECC under the BC Act
- PCT 1067 - Parramatta Red Gum
 - Not listed under the EPBC Act; EEC under the BC Act
- PCT 1800 - Swamp Oak
 - Does not satisfy thresholds for EPBC listing; EEC under the BC Act

Figures 2 to 7 show vegetation surveyed for the proposal.

Biosis validated Existing Native Vegetation (ENV) occurring to the east side of WW02 along Park Road within non certified land (Figure 6).

Remaining areas within the study area are comprised of urban native and exotic vegetation observed as undeveloped land including the majority of SP1232 and planted species along road corridors. The emergency generator will be constructed on an existing hardstand at the existing SP1154.

Eastern Creek was observed to be in poor state with little to no stream flow. Quality habitat for aquatic species was not observed. No predicted habitat for threatened aquatic species have been mapped on the DPI spatial portal or have been recorded on the BioNet Atlas of NSW (Biosis,

2022). No threatened aquatic species, populations or communities listed under the FM Act are likely to occur (Biosis, 2022).

A low condition patch of Swamp Oak Floodplain Forest (PCT 1800) is supported by Eastern Creek, however large patches of exotic grassland dominated the banks where large, eroded sections were observed (Biosis, 2022).

The degraded low quality roadside vegetation meant a limited list of threatened species was predicted to occur in the study area (refer to Biosis, 2022).

Terrestrial groundwater dependent ecosystems (GDEs) occur in two locations:

- along WW02 comprising of plant community type (PCT) 849 Cumberland Plain Woodland (medium and low ecological value GDE)
- at Eastern Creek comprising of PCT 1800 Swamp Oak open forest (medium ecological value GDE).

Potential impacts

The proposal has avoided vegetation removal with placement of assets along existing road corridors and cleared areas where possible. By adopting HDD under Eastern Creek, the proposal avoids the need to remove any Swamp Oak Floodplain Forest at Eastern Creek.

Table 6 summarises the vegetation impact from the proposal.

Table 6. Vegetation impact summary

Asset	Non-certified land	Certified land
SP1232	0.12 ha – PCT 849 (not ENV) 0.21 ha - urban native/ exotic	0.01 ha – PCT 849 0.07 ha - urban native/ exotic
WW02	2.3 ha - urban native/ exotic	0.44 ha – PCT 849 3.26 ha - urban native/ exotic
WW03	2.30 ha - urban native/ exotic	0.22 ha – PCT 725 0.03 ha – PCT 849 3.06 ha – urban native/ exotic
Emergency generator at existing SP1544	N/A	N/A

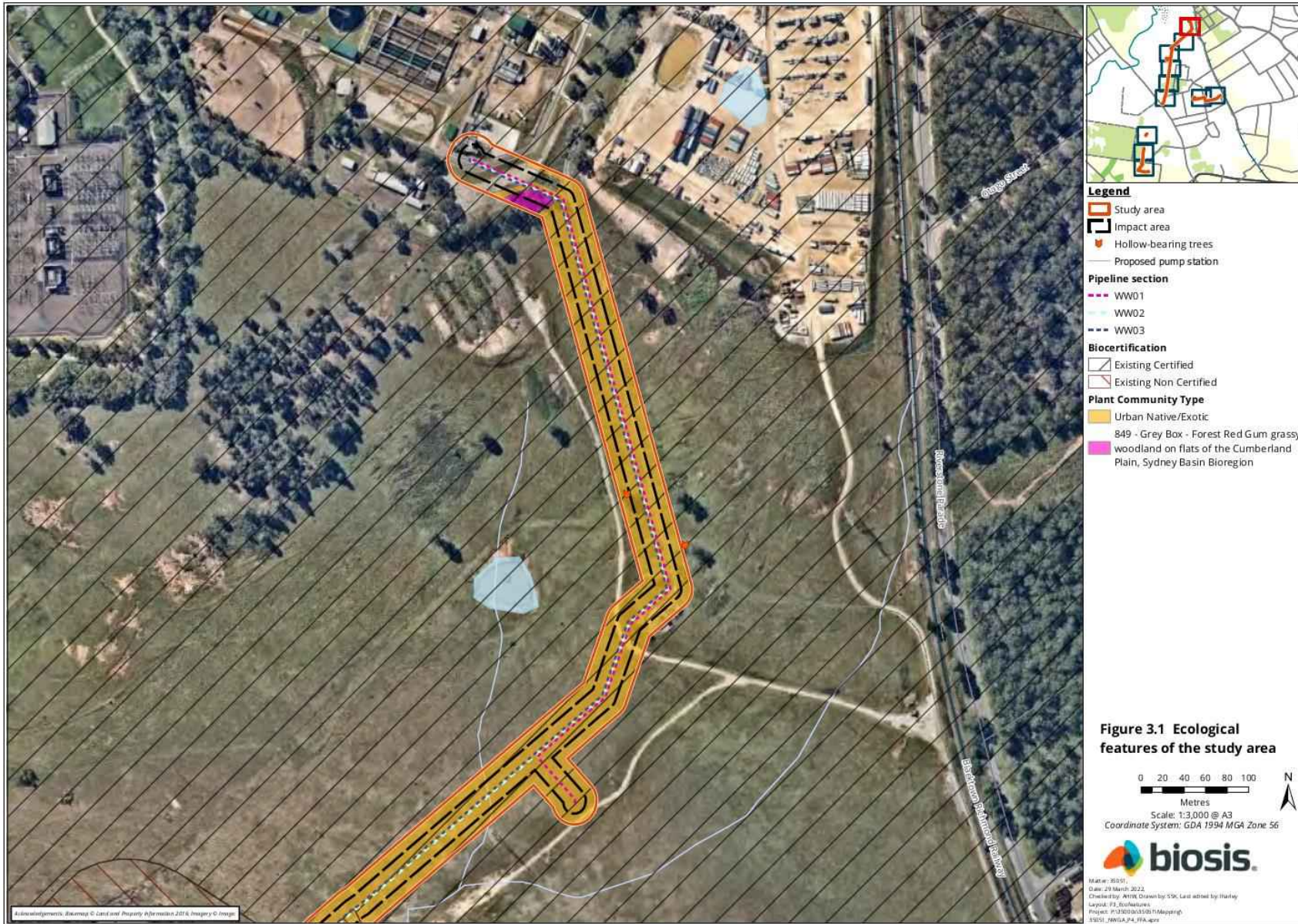


Figure 2. Vegetation (map 1 of 6) as surveyed by Biosis (2022)

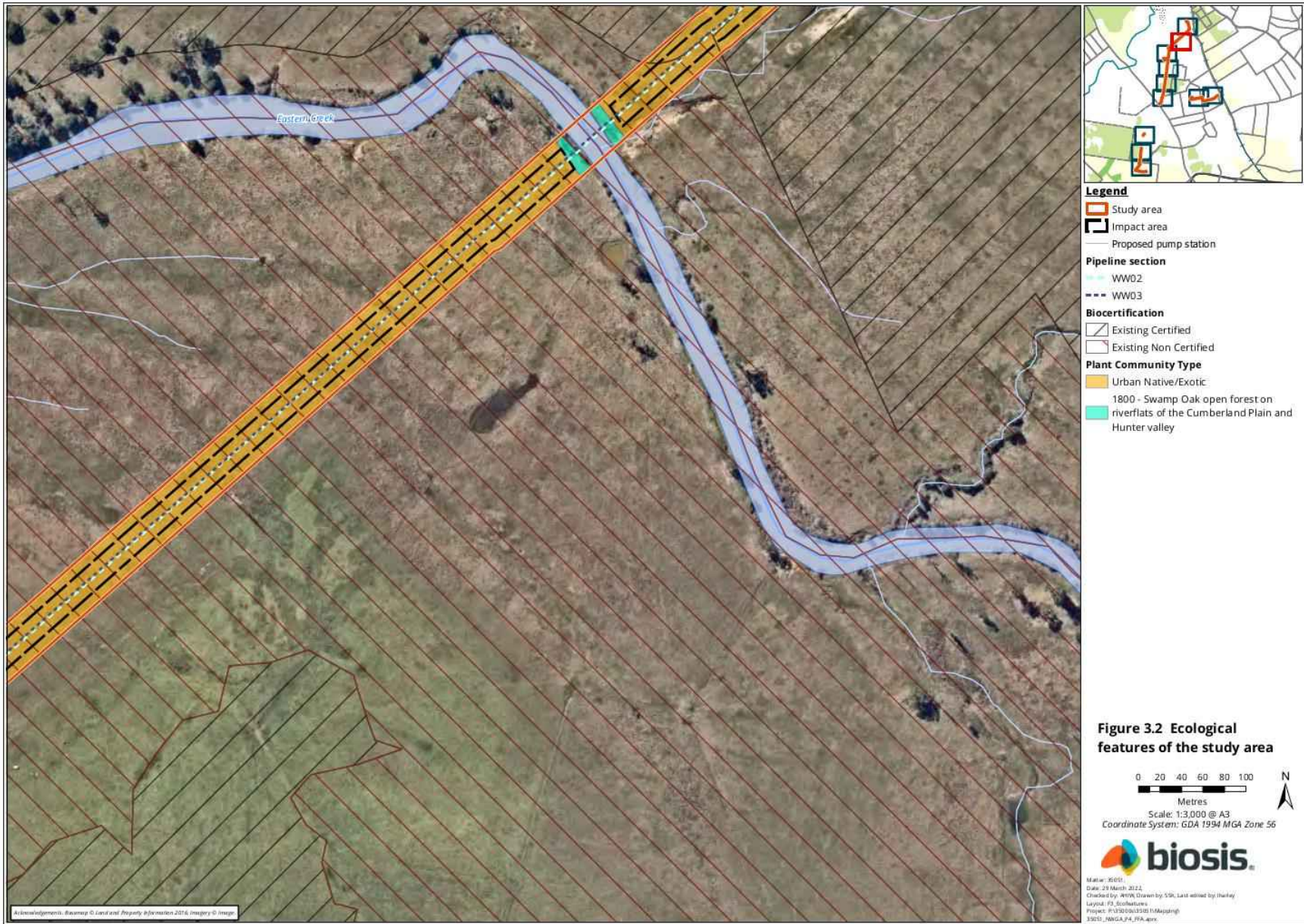


Figure 3. Vegetation (map 2 of 6) as surveyed by Biosis (2022)



Figure 4. Vegetation (map 3 of 6) as surveyed by Biosis (2022)



Figure 5. Vegetation (map 4 of 6) as surveyed by Biosis (2022)

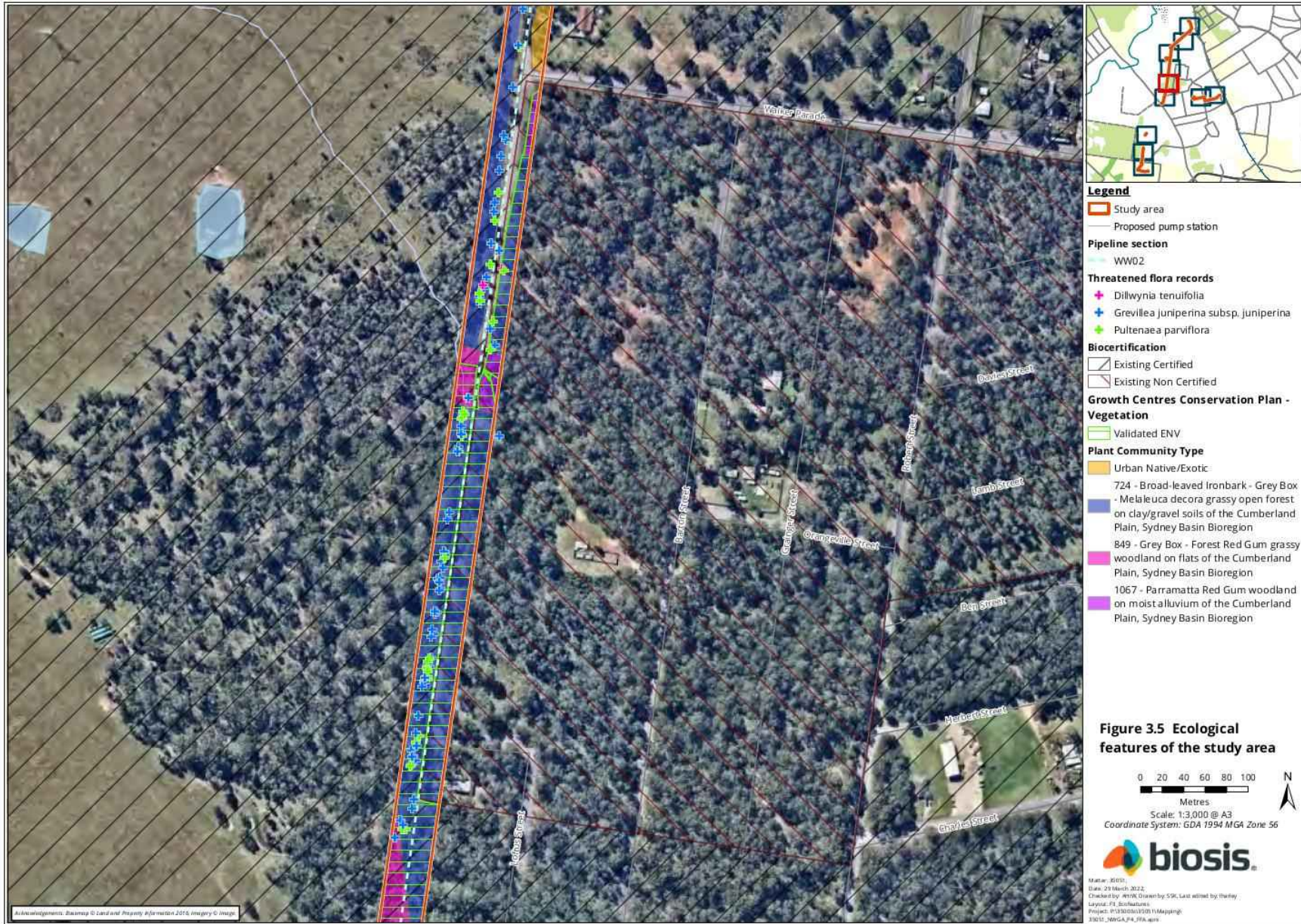


Figure 6. Vegetation (map 5 of 6) as surveyed by Biosis (2022)

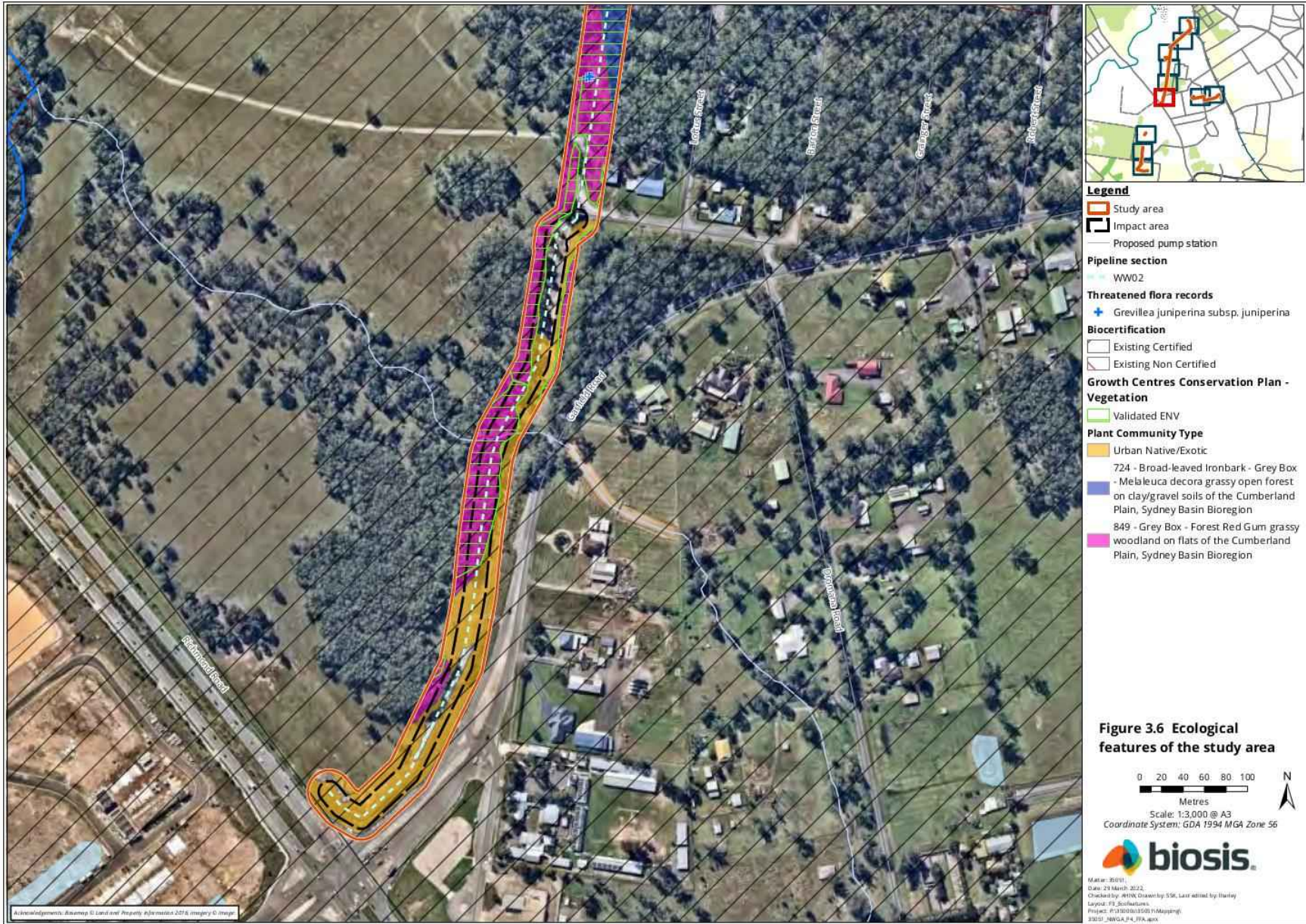




Figure 7. Vegetation (map 6 of 6) as surveyed by Biosis (2022)



Impacts to Cumberland Plain Woodland (PCT 849), a CEEC listed under the EPBC Act and BC Act is unavoidable. Impacts to Broad leaved Ironbark (PCT 725), an ECC under the BC Act are also unavoidable. An assessment against the Commonwealth significant impact criteria was completed. The assessment concluded that a significant impact on a matter of national environmental significance was not likely to result. Tests of significance (ToS) were also completed for CPW under the BC Act. The assessment showed that a significant impact was not likely to result from the proposal which impacts previously degraded vegetation. A BDAR or species impact statement was not required.

No threatened flora species were recorded in non-certified land. The following threatened flora species were recorded in certified land:

- 180 Juniper-leaved Grevillea were recorded along Park Road
- 120 *Pultenaea parviflora* were recorded along Park Road
- 14 *Dillwynia tenuifolia* were recorded along Park Road

As these populations occurred entirely within certified land they are not subjected to further assessment (a ToS was not required).

The threatened flora species are located adjacent to WW02. The construction of WW02 is to be contained within Park Road and no impacts to vegetation are proposed.

Potential impacts to GDEs due to groundwater extraction during construction or lateral movement of groundwater along pipeline backfill material is discussed in Section 5.2.

Five hollow-bearing trees (HBTs) were recorded within the study area, however no HBTs will be impacted by the proposed works. The proposal is therefore unlikely to significantly impact any threatened microchiropteran bat species predicted to occur in the area. ToS was not required for these species.

Grey-headed flying fox camps are absent within the study area. Habitat for the Square-tailed Kite and Little Eagle were not observed. ToS was also not required for these species.

The Cumberland Plain Snail inhabits Cumberland Plain Woodland vegetation comprising logs and leaf litter as observed along WW02. High quality CPW is present along Park Road, Riverstone, however no native vegetation or tree removal will be required in high quality CPW. Poor condition CPW which will be removed occurs in the electrical easement and has a low availability of litter habitat due to regular maintenance. Given the degraded areas of habitat, avoidance of tree impacts and the low availability of litter habitat it is unlikely that the proposed works will impact significant habitat for the Cumberland Plain Snail and therefore a ToS was not required.

Eight priority weeds recorded in the study area are Madeira Vine, Asparagus Fern, Bridal Creeper, Lantana, African Boxthorn, African Oliva, Common Prickly Pear and Fireweed (refer to Biosis, 2022). Uncontrolled handling of weeds during construction may inadvertently spread weed propagules into adjacent land and into drainage lines with the potential to spread weeds downstream.

Safeguards recommended below will be implemented to minimise such impacts as much as practicable. The safeguards include offsetting requirements for vegetation removal.

Some vegetation on the eastern side of Park Road (as shown in Figure 1 and Figure 6), is existing Native Vegetation (ENV) within non certified land. Under the Biodiversity Certification Order of the SEPP (Precincts - Central River City) 2021, Condition 12, clearing of vegetation in this area must be approved by EES. This area will not be impacted by the proposal. Due to the proposal's close proximity to this vegetation, the area will be designated as a no-go zone.

Although formal offsets are not required under the BC Act, Sydney Water has an internal position to deliver a 'maintained or enhanced' biodiversity outcome if projects have residual biodiversity impacts. Based on the vegetation to be cleared in certified land, offsets will be provided at the ratio specified in the safeguards below.

Safeguards

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 Sydney Water's Environmental and Community Representatives and affected landowners). Sydney Water considers vegetation removal in these circumstances has minimal environmental impact.

- Any minor:
 - vegetation trimming or
 - removal of exotic vegetation or
 - removal of planted native vegetation

where the vegetation is not a threatened species (including a characteristic species of a threatened community or population), heritage listed, in declared critical habitat or in a declared area of outstanding biodiversity value.

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

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

Residual impacts to native vegetation (non-ENV) and trees will be offset in accordance with the Biodiversity Offset Guideline ([SWEMS0019.13](#)). Based on 0.82 ha of TEC removal (PCT 849 and PCT 725), 2.46 ha of offsets will be provided. Parcels of land the vicinity of the proposal are currently being investigated.

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](#).

All staff to be educated on ID characteristics of the threatened species and advised to not handle fauna species under any circumstances during toolbox talks.

No go zone with protective fencing must be installed around all records of Juniper-leaved Grevillea, Pultenaea parviflora and Dillwynia tenuifolia in order to minimise potential inadvertent trampling of these species during construction. Should it be determined during detailed design that impacts are unavoidable, further assessment would be required. No go zones with protective fencing must also be installed around ENV within non-certified land (Condition 12 vegetation). This vegetation must not be removed.

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.
If vegetation along Park Road is required to be removed for the construction of WW02, further assessment will be required for impacts within non-certified land and impacts to native vegetation and trees offset.
Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing.
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.
Potentially affected residents will be notified of any tree removal.
If native fauna is encountered on site, stop work and allow the fauna to move away unharassed. Engage a licenced ecologist if assistance is required to move fauna.
In the unlikely event that unexpected threatened species are identified during the project, works should cease and an ecologist contacted.
For any removal of tree species within native vegetation a Cumberland Plain Land Snail pre-clearance assessment and translocation of any identified individuals.
Bag all plant parts and excavated topsoil that may be infested with weed propagules and dispose at a licensed waste disposal facility.
Minimise soil transportation within, into or out of the study area to reduce the spread of weeds.
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: <ul style="list-style-type: none"> • alternative construction methodologies (under bore vegetation and waterways, compressed construction corridors) • avoiding impact to hollow bearing and habitat trees.
Vegetation removal must not occur until the following are complete: <ul style="list-style-type: none"> • the area to be removed has been physically delineated • the Contractor's Environmental Representative has confirmed consistency with approval documentation • pre-clearing surveys, if relevant and • written authorisation to commence clearing from Sydney Water Project Manager.

5.4 Heritage

Existing environment – Aboriginal heritage

A due diligence was prepared by AECOM (2022). The proposal is in an area with known Aboriginal Heritage Information Management System (AHIMS) sites. The due diligence assessment confirmed that some AHIMS sites were no longer valid (based on previous disturbance and site observations) and that the proposal will also intersect areas of two existing Aboriginal Heritage Impact Permits (AHIPs) (Table 7).



Table 7. Existing AHIPs the proposal will intersect.

Sensitive information has been removed

Existing environment – Non-Aboriginal heritage

The proposal is located near:

- a school building (Item 136) listed in the Blacktown LEP 2015, approximately 80 m west of the southern end of WW02
- Pitt town common house with local significance listing under the Hawkesbury SEPP, approximately 300 m east of the emergency generator at SP1154.

Potential impacts – Aboriginal heritage

The proposal will intersect with the valid AHIMs or sensitive sites shown in Table 8. Potential impacts to culturally sensitive sites at the north portion of WW02 can be managed under an existing AHIP. Further investigations are currently being undertaken. If needed, an AHIP will be obtained for the remaining locations.

Table 8. Valid AHIMs sites or area with cultural sensitivity that the proposal will intersect.

Sensitive information has been removed

Potential impacts – Non-Aboriginal heritage

The proposal will not impact any listed heritage items.

Safeguards

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.

Requirement for an AHIP at three locations shown in Table 8 are subject to further investigations.

Harm to any Aboriginal objects and declared Aboriginal places is only permitted once an Aboriginal Heritage Impact Permit (AHIP) has been granted. Include Aboriginal Heritage Management Plan (AHMP) in CEMP to address AHIP conditions.

Written approval from Riverstone Parade Pty Ltd is required to conduct works under AHIP C0001996. Written approval is required from TfNSW (Roads and Maritime) to conduct works under AHIP C0000359.

If any Aboriginal object or 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 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.

5.5 Noise and vibration

Existing environment

The proposal is located largely within a rural setting with rural residential properties located east and south east of SP1232. The northern section of WW02 is located in an industrial setting near Riverstone WWTP. Sensitive noise receivers include:

- Australian Christian College, approximately 400m south east of SP1232
- Marden Park Masjid, approximately 1000 m south east of SP1232
- Marsden Park Public School, approximately 100 m east of WW02 across Garfield Road West
- Fitz Kidz Learning Centre, approximately 250 m south west of SP1154.

Potential impacts

The proposal will generate noise during construction. The likelihood of noise impact from the proposal was reviewed against risk factors (following Table 2 of the EPA's 2020 Draft Construction

Noise Guideline). The review indicated that the likelihood of noise impact will be low risk and therefore a qualitative noise impact assessment was undertaken.

The works will be conducted during standard construction hours. Sensitive land uses which may potentially be affected by the work include rural residents near Park Road, two schools and a religious centre identified above. The closest sensitive receiver, Marsden Park Public School is approximately 100 m from temporary construction works proposed for WW02. Marsden Park Public school is also about 150 m from a major intersection (Richmond Road with Garfield Road West) where traffic noise is expected to be a dominant noise source. Construction work for the pipelines will be temporary, lasting a week or two in one location, before moving along the alignment.

Construction work at SP1232 and for the emergency generator at SP1154 will also be temporary but of longer duration (about 20 months for SP1232). The nearest sensitive receivers are located, about 40 m from SP1154 and between 400 m and 1 km away from SP1232. Noise source controls will be implemented where feasible to minimise potential impacts. Communications with nearby receivers may also identify opportunities for optimal respite periods where required. All reasonable and feasible measures will be implemented to reduce noise impacts during construction.

During operation, noise will not be generated by WW02 and WW03. Noise generated from SP1232 is expected to be low due to submersible pumps. Noise levels of equipment at the pump station will need to be confirmed during commissioning. Noise will not be generated from the emergency generator at SP1154 except in during an emergency power outage (which is not expected to occur more than once a year). Some noise may be generated during periods of testing or maintenance, however these are not expected to occur for more than one hour. Operation of the emergency generator (and therefore noise generation) will be for a limited number of hours until power is restored. Noise generated during operation is not anticipated to exceed the noise criteria in the Noise Policy for Industry (EPA, 2017).

The proposal may generate temporary vibration during construction activities such as rock breaking. However, this is not anticipated to generate vibration that would impact receivers during construction. Vibration will not be generated during operation.

Safeguards

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.

The Proposal will also be carried out in accordance with:

- Sydney Water's Noise Management Procedure SWEMS0056
- Noise Policy for Industry (EPA, 2017).

Reasonable and feasible noise mitigation measures should be implemented to mitigate noise impacts.

Incorporate **standard daytime hours noise management safeguards** into the CEMP:

- identify and consult with the potentially affected residents prior to the commencement:
 - 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 (eg 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 (eg 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 (eg 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).

If works **beyond standard daytime hours are needed**, the Contractor will:

- justify the need for out of standard daytime work
- consider potential noise impacts and: implement the relevant standard daytime hours safeguards; Sydney Water's Noise Management Code of Behaviour (SWEMS0056.01) 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.

If **night works are needed**, the Contractor will:

- 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 (ie 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.
- 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 will:

- 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.

5.6 Air and energy

Existing environment and potential impacts

The proposal is located largely within a rural setting with rural residential properties located east and south east of SP1232, and adjacent to SP1154. The northern section of WW02 and WW03 is located in an industrial setting near Riverstone WWTP.

The proposal will potentially result in dust/emission generation from:

- excavation works during construction
- construction vehicles travelling on disturbed/ unsealed access routes
- emissions from machinery, equipment and vehicles used during construction.

The design has considered potential odour impacts and need to reduce these. During operation, odour impacts may be generated if maintenance is required. Air relief valves along WW02 and WW03 are connected to carbon canisters to minimise odour impacts during maintenance. The pipelines will also connect to existing ventilation stacks where possible and new ventilation stacks (up to 18 m high) will be constructed along the alignment and at SP1232 to minimise potential odour impacts during operation.

Regarding energy use, the design allows for potential future roof top solar PV system installation on the SP1232 switchroom which will be subject to review during detailed design.

Safeguards
Use alternatives to fossil fuels where practical and cost-effective.
Track energy use as per SWEMS0015.28 Contractor NGER template .
Minimise the potential for odours (eg minimise the number of open access chambers, close maintenance holes overnight.)
Ensure odour control measures are available and ready to use during the works.
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.

5.7 Waste and hazardous materials

Existing environment and potential environmental impacts

Our corporate objectives include being 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 will generate surplus soil and rock during excavations for WW02, WW03 and SP1232. Excavated spoil is expected to be in the order of 9,000 tonnes. Opportunities to reduce, recycle and reuse on this project will be sought with the Contractor and documented in the Waste Management Plan or CEMP. Excavated soils can be reused on site providing contaminant levels are below the relevant screening criteria (Aurecon Arup, 2021). Excavated soils may be reused on another site if the soil meets the definition of Virgin Excavated Natural Material (VENM) or Excavated Natural Material (ENM).

Demolition waste from excavation of roads will be generated. There is also a potential for hazardous materials including asbestos to be encountered in soils at Riverstone WWTP where WW02 and WW03 will connect. Green waste including weeds and groundwater that cannot be reused will also be managed for disposal.

Waste will be classified prior to disposal off site to a facility licenced to accept the waste.

Safeguards
Manage waste in accordance with relevant legislation and maintain records to show compliance eg waste register, transport and disposal records. Record and submit SWEMS0015.27 Contractor Waste Report .
Provide adequate bins for general waste, hazardous waste and recyclable materials.
Minimise the generation of waste, sort waste streams to maximise reuse/recycling in accordance with the Waste Avoidance and Resource Recovery Act 2001 .
Manage waste and excess spoil in accordance with the NSW EPA Waste Classification Guidelines. Dispose wastes at an appropriately licenced facility. Excavated soils should be stockpiled separately based on waste types to avoid cross contamination with VENM or ENM.
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.
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 Property Environmental Services propertyenvironmental@sydneywater.com.au).

5.8 Traffic and access

Existing environment

WW02 extends from Richmond Road, a state road and along Park Road, a two way sealed local road with no street parking, connecting rural residential properties near SP1232. The Blacktown to Richmond Railway line is located to the east of WW03. The proposal will not intersect with any State Road or railway lines. The southern end of WW02 is located within 100 m of a State road and traffic signals. WW02 and WW03 will be located within existing high voltage overhead transmission easements north of SP1232.

Potential impacts

Construction would generate light and heavy vehicle movements associated with worker movements, the transportation of construction machinery, equipment, and materials to the site. A maximum of 12 heavy vehicle movements and 13 light vehicle movements are expected per day during construction.

WW02 and SP1232 are accessed via Richmond Road, Garfield Road West and Park Road. An access road off Park Road will be constructed for SP1232 in consultation with MPN developers. North of Park Road, an access track in cleared land will be established for the construction of WW02 and WW03 which will be laid in the same trench (in addition to another pipeline north of Eastern Creek, WW01 approved under Project 1). No new access tracks are required for the proposed emergency generator at SP1154.

Lane closures will be required along Park Road. The Contractor will consult with Blacktown City Council regarding any temporary local road lane closures and road occupancy licences. The Contractor will notify TfNSW road regarding WW02 works located within 100 m Richmond Road and traffic signals at the intersection of Richmond Road and Garfield Road West.

The proposal will not impact access to private properties. As there is no street parking, availability of street parking is not impacted. Traffic and access will be managed by a Traffic management plan.

The Contractor will consult with the energy distributor regarding proposed construction work near and within existing high voltage electricity easements and overhead lines.

Safeguards

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 the relevant authority, including TfNSW if works are within 100m of traffic signals when construction commences.

Proceed with works as per the energy distributor's possession requirements for works under HV transmission lines.

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

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

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

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

5.9 Social and visual

Existing environment and potential impacts

The existing landscape is largely rural and cleared of vegetation with the exception of Park Road which features established vegetation along the road.

The main impacts to the community during construction are:

- amenity impacts including following vegetation removal (Section 5.3)
- aboriginal heritage (Section 5.4)
- noise and vibration (Section 5.5)
- dust and odour (Section 5.6)
- traffic and access (Section 5.8).

The majority of impacts during construction will be temporary. These temporary impacts will be mitigated in consultation with stakeholders, such as road authorities and residents in addition to the safeguards listed below. There will also be some temporary visual impacts associated with the establishment of site compounds and worksites during construction.

Ventilation stacks (up to 18 m high) and SP1232 will be permanent above ground structures. These structures will adopt colours that will not be obtrusive against the surrounding landscape. Where appropriate, additional plantings to be undertaken along site boundaries to obscure views of infrastructure from sensitive receivers.

Overall, the proposal is not expected to have more than a minor visual impact.

Safeguards

Undertake works in accordance with Sydney Water Communications policies and requirements including:

- notify impacted residents and businesses
- erect signs to inform the public on nature of work
- personnel treat community enquiries appropriately.

Work sites will be restored to pre-existing condition or better.

Minimise visual impacts (eg retain existing vegetation where possible).

Direct artificial light away from sensitive receivers where possible (ie residents, fauna or roadways).

Maintain work areas in a clean and tidy condition.

5.10 Cumulative

Potential environmental impacts

Sydney Water is aware of the following future works planned for the area that may intersect with the proposal.

- Garfield Road West road upgrade – construction timeframe to be confirmed
- Bandon Road upgrade - construction timeframe to be confirmed
- Sydney Water upgrades at Riverstone WWTP – construction period 2024-2028
- Riverstone Parade Pty Ltd on Lot 211/DP830505 (Sakkara site) for bulk earth works under Construction Certificate issued dated 24/05/2019 (located near Riverstone WWTP)
- Marsden Park North Precinct development – pending rezoning.

Safeguards

The Contractor will work with local developments and roads authorities to reduce impacts where feasible.

5.11 General Environmental Management

The following general environmental management safeguards will be implemented:

Safeguards

Prepare a Construction Environmental Management Plan (CEMP) addressing the requirements of this environmental assessment. The CEMP should identify licence, approval and notification requirements. Prior to the start of work, all project staff and contractors will be inducted in the CEMP.

The CEMP must be readily available on site and include a site plan which shows:

- go/ no go areas and boundaries of the work area
- location of environmental controls (including erosion and sediment controls, any fences or other measures to protect vegetation or fauna, spill kits, stockpile areas)
- location and full extent of any vegetation disturbance.

Sydney Water's Project Manager (after consultation with the Project's environment and community representatives and affected landowners) can approve temporary ancillary construction facilities (such as compounds and access tracks), without additional environmental assessment or approval if the facilities meet the following principles:

- limit proximity to sensitive receivers

- no disruption to property access
- no impact to known items of non-Aboriginal and Aboriginal heritage
- outside high-risk areas for Aboriginal heritage
- use existing cleared areas and existing access tracks
- no impacts to remnant native vegetation or key habitat features
- no disturbance to waterways
- potential environmental impacts can be managed using the safeguards in this REF
- no disturbance of contaminated land or acid sulfate soils
- will be rehabilitated at the end of construction.

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

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

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

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

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

All site personnel should be inducted into the IMP.



6 Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of North West Growth Area Package 4A – Project 2. The proposal is required to enable wastewater servicing to the Marsden Park North community as it grows to year 2024.

During construction, the main potential environmental impacts of the proposal are typical construction impacts such as erosion and sedimentation, dust, vegetation removal, aboriginal heritage, and noise. During operation, the main impacts are associated with visual amenity.

It is considered that, given the nature, scale and extent of impacts and implementation of the safeguards outlined in this REF, the proposed work is unlikely to have a significant impact on the environment and 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.



7 Appendices

References

Sydney Water 2021a. North West Growth Area – Package 4A Geotechnical Desk Study, October 2021

Sydney Water 2021b. Review of Environmental Factors for North West Growth Area Package 4A – Bundle 1, July 2021

Sydney Water 2021c. North West Growth Area Package 4A – Bundle 1 REF addendum. DW03-New DN600 (DICL), December 2021

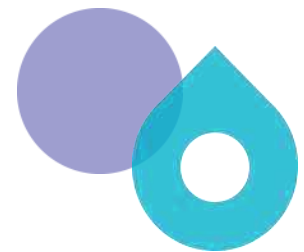
Aurecon Arup 2021. NWGA – Package 4A Preliminary Site Investigation, November 2011

AECOM 2022. Aboriginal archaeological due diligence assessment for proposed water infrastructure, northwestern Sydney, NSW, February 2022

Biosis 2022. North West Growth Centre: Flora and fauna assessment, April 2022

Appendix A – Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	There may impacts on the community from erosion and sedimentation, dust, vegetation removal, aboriginal heritage and visual amenity. The majority of these are short term impacts. Noise impacts at SP1232 will occur across a longer construction duration and all reasonable and feasible measures including source controls will be implemented to reduce noise impacts on the local community. There will be environmental improvements by providing a reliable wastewater to the growing local community.
Any transformation of a locality	The proposed work will not result in the transformation of a locality.
Any environmental impact on the ecosystems of the locality	The proposed work will not result in environmental impacts to ecosystems of the locality. There will be environmental improvements by ensuring a reliable wastewater service will collect and treat wastewater, minimising any impacts on the local ecosystems.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposed work will not result in a reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality.
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	The proposal has the potential to impact culturally sensitive sites at the north portion of WW02. Investigations currently underway will confirm the requirement for an AHIP. This process involves consultation with Registered Aboriginal Parties and local indigenous participation in order to reduce any potential impacts of the proposal on cultural values and enable cultural site information and values to be shared with current generations and be available for future generations.
Any impact on the habitat of any protected animals (within the meaning of the <i>Biodiversity Conservation Act 2016</i>)	The proposed work will not have any impact on the habitat of protected animals.
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	The proposed work will not be endangering any species of animal, plant or other form of life, whether living on land, in water or in the air (Section 5.3).



Any long-term effects on the environment	The proposed work will not have any long-term adverse impacts on the environment but will have a long-term benefit by providing a reliable wastewater service for the area.
Any degradation of the quality of the environment	The proposed work will not cause the degradation of the quality of the environment. Vegetation that will be removed for construction of the proposal will be replanted in the local area. Parcels of land in the vicinity of the proposal are currently being investigated for replanting opportunities.
Any risk to the safety of the environment	The proposed work will not increase risk to the safety of the environment. The design incorporates redundancy storage in the event of power failures and includes emergency generator back up. The CDU is designed with adequate bunding in the event of a spill. On-site chemicals will be stored in accordance with safety data sheet requirements.
Any reduction in the range of beneficial uses of the environment	The proposed work will not have any reduction in the range of beneficial uses of the environment.
Any pollution of the environment	Environmental safeguards will mitigate the potential for the proposed work to pollute the environment. No pollution of the environment is expected. The new assets will form part of the Riverstone Sewage Treatment system and operate under existing EPL 1796.
Any environmental problems associated with the disposal of waste	The disposal of wastes will be conducted in accordance with the environmental safeguards, 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 proposed work 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	The proposed work may co-incide with local construction activities in the area. Cumulative environmental impacts are therefore possible. Concurrent construction activities will be managed by the Contractor to minimise the potential for cumulative impacts during the construction phase.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The proposed work will not have any impact on coastal processes or hazards.
Any applicable local strategic planning statements, regional strategic plans or district strategic plans made under the EP&A Act, Division 3.1	Under the Greater Sydney Region Plan – A Metropolis of Three Cities (Greater Sydney Commission, 2018), the proposal aligns to Planning Priority C1 – planning for a city supported by





infrastructure for the Central River City catchment for which the NWGA wastewater catchment is located.

Any other relevant environmental factors.

The proposed work has been assessed against the factors listed above, and there are no other relevant environmental factors to consider.

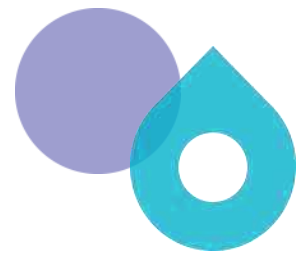


Appendix B – Consideration of TISEPP consultation

TISEPP section	Yes	No
Section 2.10, council related infrastructure or services – consultation with council		
Will the work:		
Potentially have a substantial impact on stormwater management services provided by council?		x
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		x
Involve connection to, and have a substantial impact on, the capacity of a council owned sewerage system?		x
Involve connection to, and use of a substantial volume of water from a council owned water supply system?		x
Involve installation of a temporary structure on, or enclosing, a public space under council's control that will cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential?		x
Involve excavation of the surface of, or a footpath adjacent to, a road for which the council is the roads authority that is not minor or inconsequential?	x	
Section 2.11, local heritage – consultation with council		
Is the work likely to affect the heritage significance of a local heritage item, or of a heritage conservation area (not also a State heritage item) more than a minor or inconsequential amount?		x
Section 2.12, flood liable land – consultation with council		
Will the work be located on flood liable land (that is land that is susceptible to flooding by the probable maximum flood event) and will they alter flood patterns other than to a minor extent?		x
Section 2.13, flood liable land – consultation with State Emergency Services		
Will the work be located on flood liable land (ie. land that is susceptible to flooding by the probable maximum flood event) and undertaken under a relevant provision*, but not the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance? * (e) Div.14 (Public admin buildings), (g) Div. 16 (Research/ monitoring stations), (i) Div. 20 (Stormwater systems)?	x	
Section 2.14, development with impacts on certain land within the coastal zone– council consultation		
Is the work on land mapped as coastal vulnerability area and inconsistent with a certified coastal management program?		x
Section 2.15, consultation with public authorities other than councils		
Will the proposal be located on land adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i> or to land acquired under Part 11 of that Act? <i>If so, consult with DPE (NPWS).</i>		x
Will the proposal be located on land in Zone E1 National Parks and Nature Reserves or in a land use zone that is equivalent to that zone? <i>If so, consult with DPE (NPWS)</i>		x
Will the proposal comprise a fixed or floating structure in or over navigable waters? <i>If so, consult TfNSW</i>		x
Will the proposal be located 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>		x
Will the proposal involve clearing of native vegetation on land that is not subject land (ie non-certified land)? <i>If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021.</i>		x

Appendix C – Consideration of Chapter 9 of SEPP (Biodiversity and Conservation)

Section 9.4	Comment
<i>The aim of Chapter 9 of the TISEPP is to protect the environment of the Hawkesbury-Nepean River system by ensuring that the impacts of future land uses are considered in a regional context.</i>	This REF assesses the impacts of the proposal and considers the potential regional impacts. The proposal is not anticipated to have any significant and/ or regional level impacts. This proposal will not change the future land use but will support and service future development within the region.
<i>The strategies listed in the Action Plan of the H-N Environmental Planning Strategy</i>	The proposal is not inconsistent with any of the strategies listed in the Action Plan.
<i>Whether there are any feasible alternatives to the development or other proposal concerned.</i>	Alternatives to the proposal were considered as described in Section 1.2.
<i>The relationship between the different impacts of the development or other proposal and the environment, and how those impacts would be addressed and monitored.</i>	Section 5 of this REF assesses the potential impacts of the proposal and identifies mitigation measures to minimise these impacts.
Section 9.5	Comment
<i>Total catchment management</i>	Section 5.2 assess the potential impacts of the proposal on the catchment. The proposal would not result in any significant impacts on the catchment.
<i>Environmentally sensitive areas</i>	Receiving waterway environments into which the proposal will impact are existing disturbed systems surrounded by cleared rural lands. The impacts to waterway environments have been assessed in Section 5.2. The proposal design has aimed to reduce impacts to terrestrial vegetation and heritage discussed in Sections 5.3 and 5.4.
<i>Water quality and quantity, cultural heritage, flora and fauna.</i>	Assessment of the potential impacts on water quality, cultural heritage and floral and fauna from the proposal are summarised in Sections 5.2, 5.3 and 5.4, respectively.
<i>Riverine scenic quality</i>	There will be temporary construction impacts visible at Eastern Creek during HDD. After construction, the proposal is not anticipated to negatively impact riverine scenic quality. Where possible, connections to existing ventilation



stacks will be made to reduce the number of new stacks. Vegetation will be retained where feasible or strategic planting undertaken to minimise the potential for obstructed viewpoints to the riverine scenic landscape.

Agriculture/ aquaculture and fishing

Waterways impacted by the proposal are not sites adjacent to or used for agriculture/aquaculture or fishing.

Rural residential and urban development

This proposal will enable residential and urban development in the region. There will be temporary construction impacts to rural residents during the construction period discussed in Section 5.

Recreation and tourism

The proposal enables wastewater servicing for the future of the local area that may support future recreation and tourism activities.

Metropolitan strategy

The proposal aligns with the Central River City vision under the Greater Sydney Region Plan – A Metropolis of Three Cities, including planning for a city supported by infrastructure (Planning Priority C1).





Appendix D – Specialist studies

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 where approval has been sought from DPC's AHIMS Registrar and provided in writing to Sydney Water.

For those REFs which are being publicly displayed, all Aboriginal heritage information which identifies individual sites must be removed.