Review of Environmental Factors Addendum

North West Treatment Hub (Growth Package)
Riverstone WRRF Liquid Amplification Works
(March, 2026)

Sydney WATER

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Determination

This Review of Environmental Factors Addendum (REFA) assesses potential environmental impacts of North West Treatment Hub (Growth Package) Riverstone WRRF Liquid Amplification Works (the proposal). The REFA was prepared under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with Sydney Water both the proponent and determining authority.

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

Certification

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

Prepared by:	Reviewed and endorsed by:	Endorsed by:
[redacted]	[redacted]	[redacted]
Aaron Panozzo Environmental Scientist Sydney Water Date: 03/03/2026	**Sally Spedding** Environment Assessment Team Manager Sydney Water Date: 03/03/2026	**Justin Conway** Project Manager Sydney Water Date: 03/03/2026

Decision Statement

The main potential construction environmental impacts of the proposal relate to biodiversity. During operation, the main potential impacts are associated with water quality and geomorphology. The proposal will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats. Therefore, a Species Impact Statement (SIS) and/or Biodiversity Development Assessment Report (BDAR) is not required.

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

Determined by:		
	Elissa Howie **A/Senior Manager Environment and Heritage** **Sydney Water**	[redacted] **Date: 04/03/2026**

1 Executive summary

Sydney Water's North West Treatment Hub (NWTH) comprises the Castle Hill Water Resource Recovery Facility (WRRF), Rouse Hill WRRF and Riverstone WRRF. The NWTH provides wastewater servicing to Sydney's north-west including the North West Growth Area (NWGA) and the North West Urban Renewal Corridor along the new Metro North-West Line.

In 2022, Sydney Water proposed the NWTH upgrades to address rapid growth, meet future regulatory requirements and provide a solution that minimised impacts to the community and the environment. This was assessed in the Review of Environmental Factors (REF) – North West Treatment Hub Upgrades (Growth Package) (Growth REF, 2022). The proposed works included:

- upgrades at Rouse Hill WRRF and Riverstone WRRF
- constructing a new sludge transfer system between the Rouse Hill, Riverstone and Castle Hill WRRFs to centralise biosolids treatment at Riverstone WRRF.

In 2024, Sydney Water completed the Review of Environmental Factors Addendum (REFA) – North West Treatment Hub Upgrades (Growth Package) – Biosolids Processing and Construction Compound (Growth REFA, 2024) which included:

- construction of a new carbonisation facility at Riverstone WRRF
- upgrades at Rouse Hill WRRF and Riverstone WRRF
- removal of the sludge transfer system from the scope.

Construction has commenced at both Rouse Hill WRRF and Riverstone WRRF. This REFA has been developed to assess proposed changes at Riverstone WRRF as part of the Riverstone WRRF Liquid Amplification Works, including:

- additional treatment capacity from 30 ML/ day (Growth REF) to 41 ML/ day
- additional footprint to construct the duplicate effluent discharge main
- other minor changes to the Riverstone WRRF upgrade works.

The proposed change remains aligned with Ecologically Sustainable Development (ESD) principles. The impact assessment has shown that the proposed change's residual impacts are still acceptable and can be effectively managed through implementing a range of safeguards already identified in the Growth REF (2022), Growth REFA (2024) as well as additional safeguards documented in this REFA.

2 Introduction

This chapter provides an overview of the NWTH upgrade project as described in the Growth REF (2022). It also provides an overview of the proposed change.

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 addendum assesses the potential environmental impacts and identifies safeguards that avoid or minimise potential impacts associated with upgrades at Riverstone WRRF.

2.1 Background

Environmental Assessment 2008

In 2008, the Minister for Planning granted approval for the operation of water related services for NWGA First Release Precincts. This included approval to amplify Riverstone WRRF from 2 ML/ day to 14.2 ML/ day. The Environmental Assessment identified future upgrades which would be subject to separate environmental assessment. The proposed change includes upgrading the Riverstone WRRF for a treatment capacity of 41 ML/ day and is being assessed under Division 5.1 of the EP&A Act (REF). However, the Conditions of Approval (CoA) for the previous project have been reviewed to ensure this proposal is not inconsistent with the previous approval.

Previous REFs 2022 and 2024

Previous assessments for the North West Treatment Hub (Growth Package) include the following:

- Review of Environmental Factors, North West Treatment Hub Upgrades (Growth Package) completed in July 2022 (Growth REF 2022).
- Review of Environmental Factors Addendum, North West Treatment Hub Upgrades (Growth Package) – Biosolids Processing and Construction Compound completed in June 2024 (Growth REFA 2024).

The following outlines the approved scope relevant to the Riverstone WRRF in both the approved Growth REF (2022) and the Growth REFA (2024).

Growth REF (July 2022)

Currently, Riverstone WRRF is operating at capacity and the Growth Package has been developed to service a growing population in Sydney's north-west, improve treatment processes to meet future regulatory requirements and provide a solution that minimises impacts to the community and the environment.

The original upgrades as assessed in the Growth REF (2022) for the Riverstone WRRF include the following:

- Upgrading the Riverstone WRRF capacity to 30 ML/d average dry weather flow (ADWF) including:
    - liquid amplification
    - new anaerobic digestion
    - energy recovery facility and flexibility for future food waste co-digestion.
- Construction of a new sludge transfer system including 6.3 km of pipelines between Rouse Hill WRP and Riverstone WRRF dedicated to sludge transfer.

The upgrade was sized to receive increased sludge volumes from the area including Castle Hill, Rouse Hill and Riverstone wastewater catchments for centralised biosolids treatment and out loading.

Growth REFA (June 2024)

The changes and upgrades made to the existing scope assessed in the Growth REF can be found in Section 3.3 of the Growth REFA (2024). These changes fall under the following categories:

- solids stream upgrades
- sludge line (deleted).

Additional scope items assessed as part of the REFA include the following provisions for a carbonisation facility at Riverstone WRRF:

- gas scrubbing for drying of foul air treatment
- dryer and gasification roofed structure
- dewatered sludge to drying transfer system
- sludge dryers
- carbonisation unit and instrumentation
- hot water system
- chemical bund and out loading bay
- liquid nitrogen and supplementary LPG storage
- treated gas vent shafts.

2.2 Overview of the proposed change

The additional components of the project, proposed under the NWTH Growth Package and assessed in this REFA (2026), further augment the Riverstone WRRF treatment capacity for growth and meet the current EPL licence requirements, including:

- augmentation to the existing inlet works for increased capacity
- new upgrade secondary treatment process to cater up to 41 ML/ day
- roads and drainage within the WRRF
- expanded footprint for construction of the duplicate effluent discharge pipe

- partial relocation on-site of existing stockpile in south-west corner of WRRF for expanded secondary treatment units
- chemical storage facility and bund.

These proposed changes would increase the liquid stream capacity of the plant from 30 ML/ day to 41 ML/ day which would satisfy the EPL requirements, as well as provide for growth in the catchment.

There will be high voltage infrastructure needed to facilitate the proposal. These works would be subject to a separate approval and it is outside the scope of this REFA.

2.3 Proposal needs and Objectives

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

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

Aspect	Relevance to proposal
Proposal need	The proposal is part of the North West Treatment Hub Plant Upgrades and Sludge Transfer System (Growth Package) program. This program is required to meet population and service growth in the region.
Proposal objectives	The proposal objectives are to: • respond to growth • optimise value for money • develop an adaptable solution • implement a sustainable solution • minimise service disruption. The proposal objectives are consistent with those outlined in the Growth REF (2022) with the serviceable growth increased from 30 ML/ day to 41 ML/ day to respond to increases in population growth forecasting.

2.4 Consideration of Ecologically Sustainable Development

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

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

Principle	Proposal alignment
Precautionary principle - *if there are threats of serious or irreversible environmental damage, lack of scientific uncertainty should not be a reason for postponing measures to prevent environmental*	The proposed change will not result in serious or irreversible environmental damage and mitigation measures have been incorporated into the proposal to reduce scientific uncertainty relating to potential

Principle	Proposal alignment
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.	impacts to the environment. The proposal will continue to address wastewater servicing for a growing population in Sydney's north-west. Development in the area will not be constrained.
Inter-generational equity - *the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*	The proposed change will help to meet the needs of future generations by providing an improved and reliable wastewater service. Upgraded treatment processes will allow for the treatment of greater populations and services areas. This will benefit future generations.
Conservation of biological diversity and ecological integrity - *conservation of the biological diversity and ecological integrity should be a fundamental consideration in environmental planning and decision-making processes.*	The proposed change includes the removal of an additional 0.12 ha of non-certified native vegetation (Section 6.5). The concept design sought to minimise the impact to biological diversity and ecological integrity where practically feasible. For example, the duplication of the effluent discharge pipe will rejoin upstream of the original outfall system to reduce impact to riparian PCTs along Eastern Creek.
Improved valuation, pricing and incentive mechanisms - *environmental factors should be included in the valuation of assets and services, such as 'polluter pays', the users of goods and services should pay prices based on the full life cycle costs (including use of natural resources and ultimate disposal of waste) and environmental goals*	The proposed change will provide cost efficient use of resources and provide optimum outcomes for the community and environment through staged upgrades, optimising existing infrastructure and adopting flexible technologies.

3 Proposal description

3.1 Introduction

Table 3-1 describes the proposal and **Figure 3-3-1** shows the location and key environmental constraints.

3.2 Amended proposal

Table 3-1 includes an in-depth overview of the amended items to be assessed as part of this REFA. The main update to the proposal at Riverstone WRRF is the increase in treatment capacity of the plant from 30 ML/day (Growth REF) to 41 ML/day to support population and infrastructure growth of the north-west region. While these components were assessed in the Growth REF (2022), they will contribute to the additional treatment capacity.

These areas are shown in **Figure 3-3-1** in the yellow areas and described as the "additional construction boundary" and numbered to describe each location.

Table 3-1 Description of the amended scope at Riverstone WRRF

Additional component	Description
Augmentation to the existing inlet works	As part of this design package, the inlet works structure would be upgraded to provide the freeboard to achieve a 3,000 L/s peak wet weather flow (PWWF) (from the augmented 2,500 L/s as part of the previous design) as well as providing downstream flow splitting to the new stage 2 treatment stream. This includes modifications to odour control covers, stopboards, penstocks, handrails, stairs, odour ducts, supports and the existing flume.
Additional secondary treatment process	The secondary treatment process includes the provision of an additional bioreactor and membrane system. This would include the following: • three biological reactors with associated Membrane Bioreactor (MBR) trains • mixed liquor recycle (MLR) pumps • aeration system • flow distribution splitter • MBR drainage system • ground anchors.

Additional component	Description
Low Voltage Infrastructure	As part of this design package, the low voltage switchboards within the WRRF will be upgraded to support the provision of the following existing infrastructure: • bioreactor/MBR switch room • the inlets works switch room • filter switch room. Each low voltage switch room will be fitted with a generator connection panel which will enable temporary power to be provided via portable generator. Generator connection panels will be rated to 2,250 amps.
Ancillary Systems	Ancillary systems and site works required for this design package include the following: • Yard piping: all new yard piping would be installed using an open trench methodology. Pipe materials and pressure classes have been selected in accordance with requirements set out in the SW mechanical specification. • Service relocations: a review of the location of the proposed infrastructure upgrades identified several existing services that will need to be relocated. • Site services. • Electrical conduits.
Plant SCADA/PLC	The SCADA system for Riverstone liquid stream upgrade works is proposed to include programmable logic controllers (PLC) as the basic SCADA process control hardware. The PLC allocation and arrangement shall follow the Sydney Water SCADA standards. The SCADA system shall follow the PLC redundancy philosophy detailed in the Sydney Water SCADA standards.
Chemical storage and dosing systems	The chemical dosing systems including bulk storages, dosing pumps, dilution systems and a delivery/unloading bay which will generally be provided in one centralised facility. A new chemical storage area will be provided to store the new sodium hydroxide, liquid sugar, alum and citric acid storage tanks and dosing systems. The existing sodium hypochlorite storage area will be modified to house the new sodium hypochlorite dosing pumps.
Roads and Drainage	New internal roads and drainage are proposed to support the infrastructure upgrades. The design observes Sydney Water Civil Specification and Ausroads Guidelines, and existing roads were maintained as much as practical.

Additional component	Description
Widened construction footprint for the duplicate effluent discharge pipe	The duplicate effluent discharge pipe, designed as part of the Growth REF (2022), incorporates future expansion of the plant, peak weather flows and stormwater drainage in line with the performance specifications. The footprint of the pipe has been widened to account for the depth of the excavations. A new effluent sampling chamber will be installed on the existing Chlorine Contact Tank (CCT) outlet pipe. A new DN1500 outfall will be installed at the outlet of the new sampling chamber to discharge treated effluent from the plant to Eastern Creek by gravity. The outlet structure to the creek does not need to be amended as part of the proposed change. The duplicate pipeline will follow roughly the existing pipeline in running down Bandon Road, through private land (refer **Figure 3-1**) and connecting to the future stub at the existing outlet structure at the creek. Maintenance holes will be installed along the length of the alignment which will be trenched. Spoil will be stockpiled adjacent to the trench and then reinstated.
Partial relocation of existing stockpile in south-west of WRRF	A portion of spoil from the existing stockpile would be relocated to form a new landscaped visual amenity mound to the north-west (refer **Figure 3-1**). This relocation would make space for the main secondary treatment upgrade works area and screen the additional buildings of the WRRF from Bandon Road.

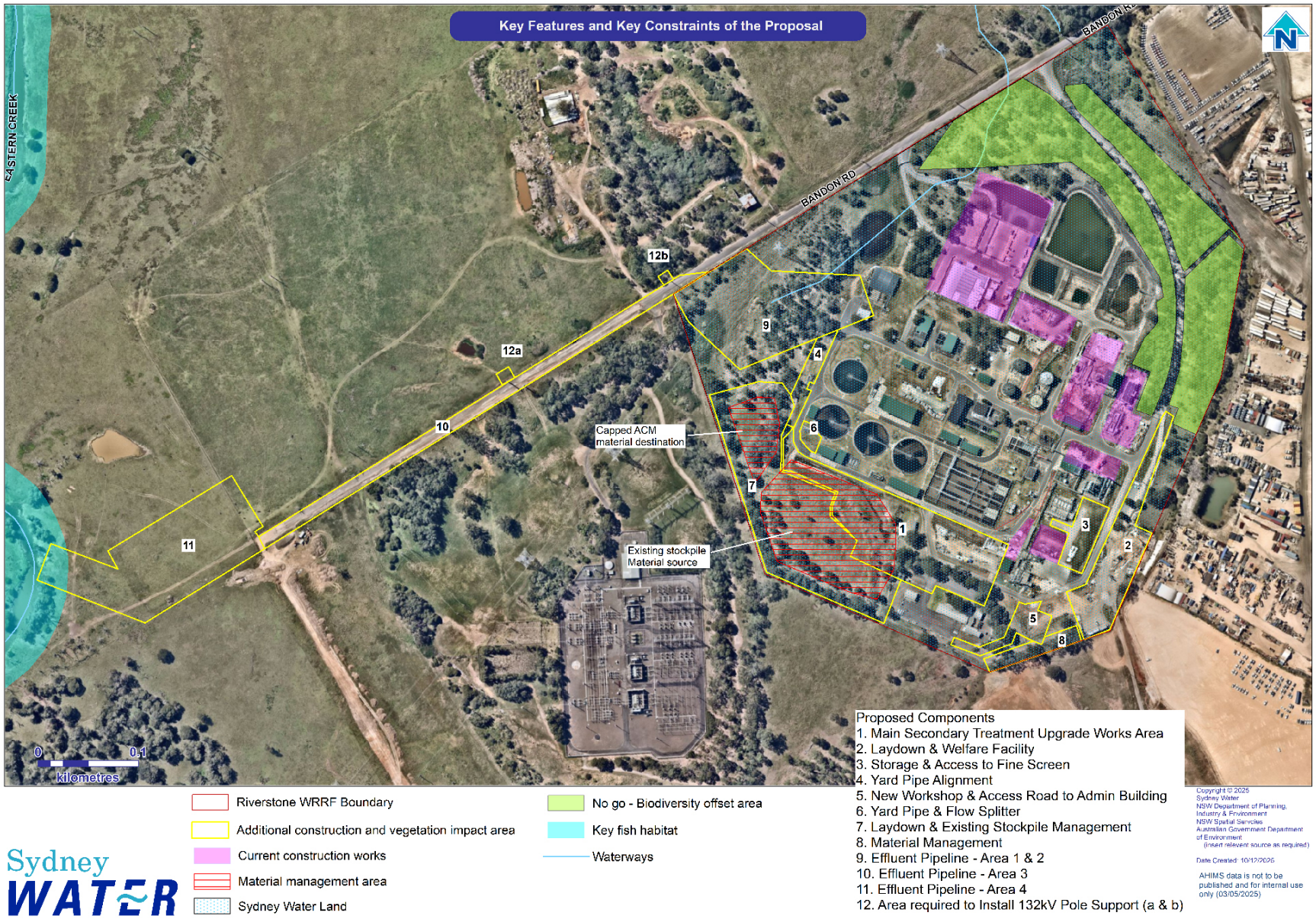

Figure 3-3-1 Key features and location of the proposed changes

3.3 Commissioning

Commissioning of the additional infrastructure will involve testing and running the new equipment to ensure it is working correctly and integrated with existing operations. The exact commissioning steps depend on the type of equipment and process but typically include:

- provide site labelling of WRRF upgrade components
- factory and site acceptance tests
- preparing and testing new infrastructure which may include hydrostatic or pressure leak tests and flow testing with water to check the performance of all equipment and safety devices
- performance testing including sampling where required
- process proving and system commissioning tests
- operator training and preparing maintenance manuals
- hydrostatic pressure testing are mandatory activities and will be completed
- process parameters sampling and analysis is required for performance testing as well as process proving.

3.4 Operation

The proposed change will facilitate improved environmental performance and enable operation of the WRRF to meet regulatory requirements while servicing growth. Riverstone WRRF must operate under EPL 1796 – Riverstone sewage treatment system including the sewage treatment plant.

During construction, the Riverstone WRRF will continue to operate to meet EPL compliance. Process flow diagrams will be updated to show the process improvements and how the facility will operate, following the construction of the proposed change. A Licence Variation Application will be prepared by Sydney Water, and submitted to the EPA prior to commissioning, ahead of the minimum 60 days timeframe set in the regulation.

3.5 Work sites, vehicle movements and access

Construction compounds may include sheds, stockpiles, parking and material storage. The indicative locations of the compound site and the proposed access roads at Riverstone WRRF remains unchanged from the Growth REF (2022) and the Growth REFA (2024).

Further details on traffic and access are provided in Section 6.9.

3.6 Working hours and time

The working hours have not changed from the Growth REF (2022) and the Growth REFA (2024), with construction work occurring during standard construction hours.

Standard construction hours include:

- 7am – 6pm (Monday to Friday)
- 8am – 1pm (Saturday).

Any out of hours works would be justified and approved according to the safeguards outlined in Section 6 of this REFA.

3.7 Field assessment area and changes to the scope of work

A field assessment was undertaken on 12 May 2025. This field assessment surveyed the areas outside the original REF (Growth REF, 2022) boundary for ecological and heritage constraints to inform specialist assessments for Aboriginal heritage and ecology.

The proposal shown in this REFA is indicative and based on the latest concept design at the time of REFA preparation. The final proposal may change based on detailed design and/or construction planning. The general mitigation measures outline when changes to the proposal trigger supplementary environmental impact assessment. If required, further assessment must be prepared in accordance with SWEMS0019.

4 Consultation

4.1 Community and stakeholder consultation

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

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

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

Our approach to community and stakeholder consultation is guided by Sydney Water's community and stakeholder engagement guidelines. The adjacent landowner received notification of inspections for environmental assessment.

This REFA will not be put on public display as has been the case with previous environmental assessments under the North West Treatment Hub Growth Package. This REFA will, however, be published on the Sydney Water website.

Consultation with stakeholders will continue throughout detailed design, construction and commissioning of the proposed change.

During construction, the North West Hub Alliance (NWHA) will be responsible for delivering the proposed change. They will consult and engage with the community, act as representatives of Sydney Water, and adhere to our community relations policies and procedures. Sydney Water will continually work with the NWHA to support and guide engagement activities during delivery and commissioning of the project.

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

4.2 Consultation required under State Environmental Planning Policies and other legislation

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

Consultation was undertaken with Hawkesbury City Council in accordance with the TISEPP Section 2.10 (f) for excavations in a council road. No response was received. Any future response will be managed in line with the Contractor's Community and Stakeholder Engagement Plan.

Department of Primary Industry (DPI Fisheries) was notified under section 199 of the *Fisheries Management Act 1994* during Growth REF (2022) preparation, as the work involves increases to effluent flows that may cause barrier to fish passage in a waterway classified as 'Key Fish Habitat'.

Their advice in 2022 was:

- they would like to review the outlet design for Eastern Creek once the design is available
- for works in Eastern Creek, any disturbance to the creek bank should be rehabilitated with native riparian vegetation to help stabilise the banks and avoid future erosion
- their general support for the addition of instream habitat such as large woody debris (or snags), boulders, riffle beds as well as deeper pools.

This proposed change does not involve a new outlet design for Eastern Creek or works in Eastern Creek itself. However, there will be excavation in mapped KFH area for connecting the duplicate effluent discharge main into the existing outlet. DPI Fisheries were re-notified of this proposal (including the increased WRRF capacity up to 41 ML/ day) on 24 June 2025. A response was received on 16 July 2025 and recommended measures are consistent with those outlined in the Growth REF (2022).

5 Legislative requirements

5.1 Strategic context

All aspects of the strategic context are consistent with what is described in the Growth REF (2022) and the Growth REFA (2024).

5.2 Environmental legislation

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

The following environmental planning instruments (Table 5-1) and legislation (Section 5.3) are relevant to the proposal. **Table 5-1** also documents any licences and permits required, and timing and responsibility for obtaining them.

Table 5-1 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Blacktown Local Environmental Plan 2015	The proposed changes within the WRRF are within the Blacktown LGA and is in land zoned SP2 (Infrastructure).
Hawkesbury Local Environmental Plan 2012	The proposed change to the effluent pipeline is within the Hawkesbury LGA and is in land zoned RU1 (Primary Production).
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	The aim of Chapter 2 (Infrastructure) of the TISEPP is for the effective delivery of infrastructure across the State. Section 2.126 permits development by or on behalf of a public authority for sewage treatment plants, biosolids treatment facilities and water recycling facilities without consent in a prescribed zone (or equivalent under Section 2.124) in the prescribed circumstances (carried out by a public authority). The project involves upgrading a sewage treatment plant in land zoned SP2 (Infrastructure) and RU1 (Primary Production) both of which are prescribed land use zones or equivalent. As Sydney Water is a public authority, the proposed change is permissible without consent.

5.3 Consideration of key environmental legislation

5.3.1 Protection of the Environment Operations Act 1997 (POEO Act)

The *Protection of the Environment Operations Act 1997* (POEO Act) provides the NSW legislative framework for the regulation of water, air and noise pollution, and the transport and disposal of waste. An environment protection licence (EPL) must be obtained for scheduled development work and scheduled activities. The proposed change involves activities that would upgrade elements of Sydney Water's wastewater systems. These are operated in accordance with EPLs that have been issued by the Environment Protection Authority (EPA) under the POEO Act. Therefore, the Riverstone WRRF Liquid Amplification works does not require a construction EPL.

As discussed in Section 3.4, the EPL for Riverstone will require a licence variation to be approved prior to operation.

5.3.2 Contaminated Land Management Act

The *Contaminated Land Management Act 1997* (CLM Act) provides the NSW legislative framework for dealing with, investigating and managing land. The assessment and management of material within the site must be done in accordance with relevant sections of the National Environment Protection Measures (Assessment of site contamination) 2013 (NEPM).

5.3.3 Biodiversity Conservation Act 2016 (BC Act)

The BC Act protects flora, fauna, habitats and ecological communities threatened in NSW. Tests of Significance (ToS) were completed for one threatened species and one threatened ecological community (TEC) protected under the BC Act. These tests determined that significant impacts are unlikely to occur as a result of the proposed changes.

5.3.4 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act protects nationally significant flora, fauna, habitats and ecological communities. A Significant Impact Criteria (SIC) assessment was undertaken for one threatened species listed under the EPBC Act. This test determined that significant impacts are unlikely to occur as a result of the proposed changes.

6 Environmental assessment

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

6.1 Approach to assessment

This REFA assesses those environmental aspects which have additional impacts from the Growth REF (2022) as detailed in the **Table 6-1**. All remaining environmental aspects and safeguards (as relevant) remain the same as detailed in the Growth REF (2022) and Growth REFA (2024).

The existing environment at the Riverstone WRRF is consistent with that which was outlined in the Growth REF (2022) and Growth REFA (2024).

The amended environmental aspects assessed below include mitigation measures additional to those outlined in the Growth REF (2022) and Growth REFA (2024).

Table 6-1 Environmental aspects that require additional environmental assessment

Environmental aspect	Construction impact	Operational impact	Specialist assessment	Relevant document – for assessment and safeguards
Topography, geology and soil	Yes	No	No	Refer to Section 6.2
Water quality and hydrodynamics	No	Yes	Yes	Refer to Section 6.3
Geomorphology and ecohydrology (waterway health)	No	Yes	Yes	Refer to Section 6.4
Groundwater	No	No	No	Refer to Growth REF (2022)
Flora and Fauna	Yes	No	Yes	Refer to Section 6.5
Heritage - Aboriginal	Yes	No	Yes	Refer to Section 6.6
Heritage – non-Aboriginal	No	No	No	Refer to Growth REF (2022)
Noise and vibration	Yes	Yes	Yes	Refer to Section 6.7

Environmental aspect	Construction impact	Operational impact	Specialist assessment	Relevant document – for assessment and safeguards
Energy, climate change risk and sustainability	No	No	No	Refer to Growth REF (2022)
Waste and hazardous material	Yes	No	No	Refer to Section 6.8
Traffic and access	Yes	No	No	Refer to Section 6.9
Social and visual	No	Yes	No	Refer to Section 6.10
Air quality	No	No	No	Refer to Growth REF (2022)
Odour	No	Yes	Yes	Refer to Section 6.11
Cumulative	No	No	No	Refer to Growth REF (2022)

6.2 Topography, geology and soils

Existing environment and potential impacts

Construction impacts

The proposed changes will not permanently alter the surface topography of the area. However, additional buildings and facilities as well as new paths and roads will increase the amount of impervious surface at the WRRF. Additional onsite stormwater infrastructure is included as part of the original design assessed in the Growth REF (2022).

Excavations will be required for the additional buildings and facilities. The amount of waste produced as a result of excavations has been outlined in Section 6.8. Excavations would be carried out in previously disturbed areas assessed in the Growth REF (2022), however, a larger construction footprint is needed to construct the duplicate pipeline (compared to the Growth REF, 2022) due to its depth.

Activities for the laying of the duplicate effluent discharge pipe would require trenching along the alignment for the laying of the pipeline. Alluvial material along Eastern Creek shows no indication or acid sulphate soils being present (according to ASS risk mapping) and no known areas of contamination have been identified nearby.

About 21,000 m^3 of existing stockpiled spoil would be relocated to make space for the expanded new secondary treatment works area. This spoil would be moved to an existing capped asbestos containing material (ACM) area on Riverstone WRRF, north of the existing stockpile. Prior to the placement of any material on top of the capped material the area must be surveyed, and a high

visibility geotextile marker layer must be placed on top of the existing cap. This relocation would then be landscaped and would provide a visual screen for some of the new infrastructure from Bandon Road.

Previous testing has been undertaken on the stockpile with over a hundred tests completed. None of the contaminants of potential concern exceeded the National Environmental Protection Measure (NEPM) soil criteria for industrial land use. Whilst gravimetric soils sampling was not conducted, two fragments of asbestos were identified. The NWHA (alongside EDP consultants) have assessed that the two fragments are unlikely to represent the entirety of the stockpile. The stockpile is considered suitable for use within the site if further assessment is undertaken. The NWHA and EDP will conduct additional assessment of the stockpile and develop a materials management plan to confirm that the material is suitable for reuse within the site. If substantial contamination is encountered during further testing and remediation is required, a Remedial Action Plan (RAP) must be developed to ensure contamination is appropriately managed on-site.

During construction, ground disturbance, vegetation clearing, excavation, and soil stockpiling, could result in potential offsite erosion and sedimentation of surrounding land and waterways. Potential impacts associated with these activities are consistent with those outlined in the Growth REF (2022) and Growth REFA (2024) and are unlikely to be of substantial additional impact and the safeguards will be applied to the additional area.

Operational impacts

Operational impacts associated with topography, geology and soils are consistent with those outlined in the Growth REF (2022) and Growth REFA (2024).

Mitigation measures

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

Table 6-2 Environmental mitigation measures — topography, geology and soils

Mitigation measures
Additional assessment including, in the first instance, a detailed desktop review of the existing south-west stockpile would be completed before any relocation is to be undertaken.
Any excavations, stockpiling and material relocation in areas within the existing asbestos capped soil area would be subject to the measures and controls described in the existing contaminated land management plan (CLMP) for the Riverstone WRRF.
Prior to the relocation of any existing stockpile material onto the ACM capped area the capped material must be surveyed, and a high visibility geotextile marker layer must be placed to separate the two.
A Material Management Plan (MMP) would be created for any material to be relocated within the site. The MMP will be implemented during any relocation works and will involve regular monitoring of soils, including spot testing. Assessment and reports must be developed in accordance with the relevant EPA guidelines.

Mitigation measures
All the monitoring works must be documented and any contamination that is identified during construction is required to be segregated from non-impacted material and treated separately, which could include on-site remediation such as encapsulation and offsite disposal. At the completion of the project a material movement summary report must be prepared documenting the movement of soils within the site.
Relocated material from the southwest stockpile must be landscaped and properly designed with engineered batters, drainage and appropriate vegetation. Future management requirements of the landscaped mound must also be developed.
If contamination is encountered and remediation is required, a Remedial Action Plan (RAP) must be developed.
If any asbestos is encountered, the unexpected contaminated finds procedure will be followed and material will be managed in accordance with the relevant sections of the Work Health Safety Act and the Safe Work Asbestos guidelines. If asbestos is encountered, it must be removed by a licenced asbestos removalist. An asbestos removal control plan must be prepared prior to removal. Airborne asbestos monitoring must be conducted by a licenced asbestos assessor during removal works. Once removal is complete and prior to reoccupation of the asbestos removal area, a clearance certificate must be issued by a licenced asbestos assessor.

6.3 Water quality and hydrodynamics

An updated water quality and hydrodynamics assessment was completed by Arup Pty Ltd in April 2025 for the proposed changes. This assessment serves as an addendum to the original report completed for the Growth REF (2022).

The full report is in Appendix D.

Existing environment and potential impacts

Methodology

This assessment identifies potential impacts based on the updated treatment capacity for ADWF of 41 ML/day. The limits for the quality of the treated effluent that will be produced is outlined in Table 6-3.

Table 6-3 Treated water quality requirements

Parameter	Units	50th percentile requirements	90th percentile requirements
BODs	mg/L	<4	<5
TSS	mg/L	<10	<15
Total Nitrogen	mg/L	<3	<5

Parameter	Units	50th percentile requirements	90th percentile requirements
Ammonia	mg/L	<0.5	<1.4
Total Phosphorus	mg/L	<0.2	<0.3
Turbidity	NTU	N/A	<0.1 (0.5 as the maximum)
Faecal Coliform	CFU/100ml	<10 (as an 80th percentile)	

The impact scenario has been revised to represent the updated capacity upgrades at Riverstone WRRF. Land use, catchment conditions and all other plant flow conditions remained unchanged from the original REF assessment. The Riverstone WRRF boundary condition file was revised to consider the increase in ADWF capacity to 41 ML/day. No amendments were made to the water quality parameters and adopted speciation.

In line with the methodology of the previous assessment, the Wianamatta-South Creek Water Quality Response Model (WQRM) was applied to simulate impacts on the hydrodynamic and water quality of Wianamatta-South Creek. The impact scenario was executed under the existing model configuration and with the revised Riverstone WRRF boundary condition incorporated.

Hydrodynamics

The hydrodynamics of Eastern Creek and Wianamatta-South Creek is not predicted to experience a material impact from the increased release volume from Riverstone WRRF:

- Dry year results show that the maximum impact in water level downstream of Riverstone WRRF, between the background and impact scenarios, was predicted to be 0.05 m. The same magnitude was also observed from the revised impact scenario.
- Wet year results show that the maximum increase in water level, between the background and impact scenarios, was predicted as 0.07 m. Between the background and revised impact scenario, the maximum increase was 0.09 m.

With both the original and the revised impact scenarios exhibiting comparable results for the dry and wet year against the background scenario, the inherent risk and hydrodynamic impacts of the increased capacity upgrades to Riverstone WRRF is unlikely to be substantial when compared to what has already been assessed in the Growth REF (2022).

Water Quality

Nutrient concentrations

The modelled changes in median concentrations between previous and revised impact scenarios identified changes to water quality downstream in Eastern Creek.

The modelled percentage changes between impact scenarios identified increases in concentration of constituents in Eastern Creek one kilometre downstream of the WRRF for a representative dry year. These increases included the following:

- 7.3% for ammonium
- 3.5% for total nitrogen
- 0.6% for total phosphorus
- 1.6% for filterable reactive phosphorus
- 2.9% for salinity.

These modelled values represent the median concentrations for a dry year, while the wet year values are lower. These concentrations diminish downstream at the confluence with Wianamatta-South Creek due to dilution from the additional flows.

The concentration profiles for these constituents do not comply with Australian and New Zealand Guidelines for Fresh and Marine Water Quality Default Guideline Values (ANZG DGVs). However, baseline conditions outlined in the Growth REF (2022) did not meet fresh and marine water quality DVGs, so the modelled impact between the previous and revised scenario remains consistent.

Nutrient loads

Results from the load analysis show increases in total nitrogen (11.61%) and total phosphorus (6.21%) for the dry year compared to what was assessed in the Growth REF (2022). The load values for the wet year are lower. However, the overall impact is expected to remain minimal as concentrations of the water quality constituents continue to attenuate further downstream.

While total loads for TN and TP have increased under the revised impact scenario, they are still within the EPL Subzone load limit for Sackville Subzone 2 under the Hawkesbury-Nepean Nutrient Framework as seen in Table 6-3.

Table 6-4 Nutrient loads for Sackville Subzone 2 compliance summary

WRRF	2036 Impact – TN (tonnes/yr)	2036 Impact – TP (tonnes/yr)	2036 Revised Impact – TN (tonnes/yr)	2036 Revised Impact – TP (tonnes/yr)
Riverstone	43.6	0.7	57.7	1.0
St Mary's	37.9	1.0	37.9	1.0
Quakers Hill	21.6	0.4	21.6	0.4
AWRC	1.7	0.1	1.7	0.1
Total estimated load	104.8	2.2	118.9	2.5

WRRF	2036 Impact – TN (tonnes/yr)	2036 Impact – TP (tonnes/yr)	2036 Revised Impact – TN (tonnes/yr)	2036 Revised Impact – TP (tonnes/yr)
Subzone load limit	126.1	2.7	126.1	2.7

Water quality summary

The minor changes in hydrodynamics and attenuation of water quality impacts downstream of the WRRF demonstrates that there are no major adverse impacts from the proposed changes at Riverstone WRRF when compared to the Growth REF (2022).

Mitigation measures

With the implementation of the mitigation measures outlined in the Growth REF (2022), impacts to water quality and hydrodynamics can be adequately managed, and residual impacts are expected to be minor.

6.4 Flooding, geomorphology and ecohydrology

An updated flooding, geomorphology and ecohydrology assessment was completed by Arup Pty Ltd in June 2025 for the proposed changes. This assessment serves as an addendum to the original assessments completed for the Growth REF (2022). The full report is in Appendix D.

Existing environment and potential impacts

Flooding

Sydney Water's HYDSTRA database contains flow data captured from flow measurement devices across various Sydney Water sites. The peak hourly flow rate was assumed to represent all effluent discharges from the WRRF, including bypass flows. The methodology adopted to represent the future WRRF operating conditions was consistent with the hydrodynamic and water quality assessment. The maximum peak hourly flow rate figure for the WRRF between 1 July 2013 to 30 June 2015 was selected to inform this assessment (baseline), similar to the Growth REF.

To assess the impact of flooding conditions from the increased ADWF capacity of Riverstone WRRF, the peak discharge and change in water level was examined. The peak 1% AEP discharge at Eastern Creek, upstream of Quakers Creek confluence was selected as the representative upstream catchment condition of Riverstone WRRF. The percentage change between the existing flood conditions to post upgrade conditions is less than 1%.

To assess the potential impacts of the revised discharge on the potential effects of flooding, an estimation of the flood depth was made using a Manning's calculation. This calculation uses a roughness coefficient, the cross section of the stream and the longitudinal slope of the stream to determine discharge and flow depth. The difference in flood depth for Eastern Creek between the baseline flood level and the post upgrade flood level is less than 0.01 metres.

Flooding impacts to downstream properties are not expected, due to the minor changes in flood conditions and modelled depth.

Ecohydrology and geomorphology

Existing waterway conditions as outlined in the Growth REF (2022) define the waterway as in poor condition, with banks stabilised by predominantly exotic canopy trees. The assessment of impacts for geomorphology and ecohydrology was revised based on the changes to the discharge conditions (increase to 41 ML/day) and the catchment conditions (projected 2036 western parkland development) (refer Appendix D for full report).

Impacts to Eastern Creek were assessed in three locations (A, B, and C) (refer **Figure 6-1**). Impacts to ecohydrology were measured using fish species identified in Eastern Creek. The expected change in flow velocity was compared to threshold velocities for impacts to the identified species. The sensitivity to impact at each location are:

- location A - low sensitivity of environment to impact
- location B - medium sensitivity of environment to impact
- location C - low-medium sensitivity of environment to impact.

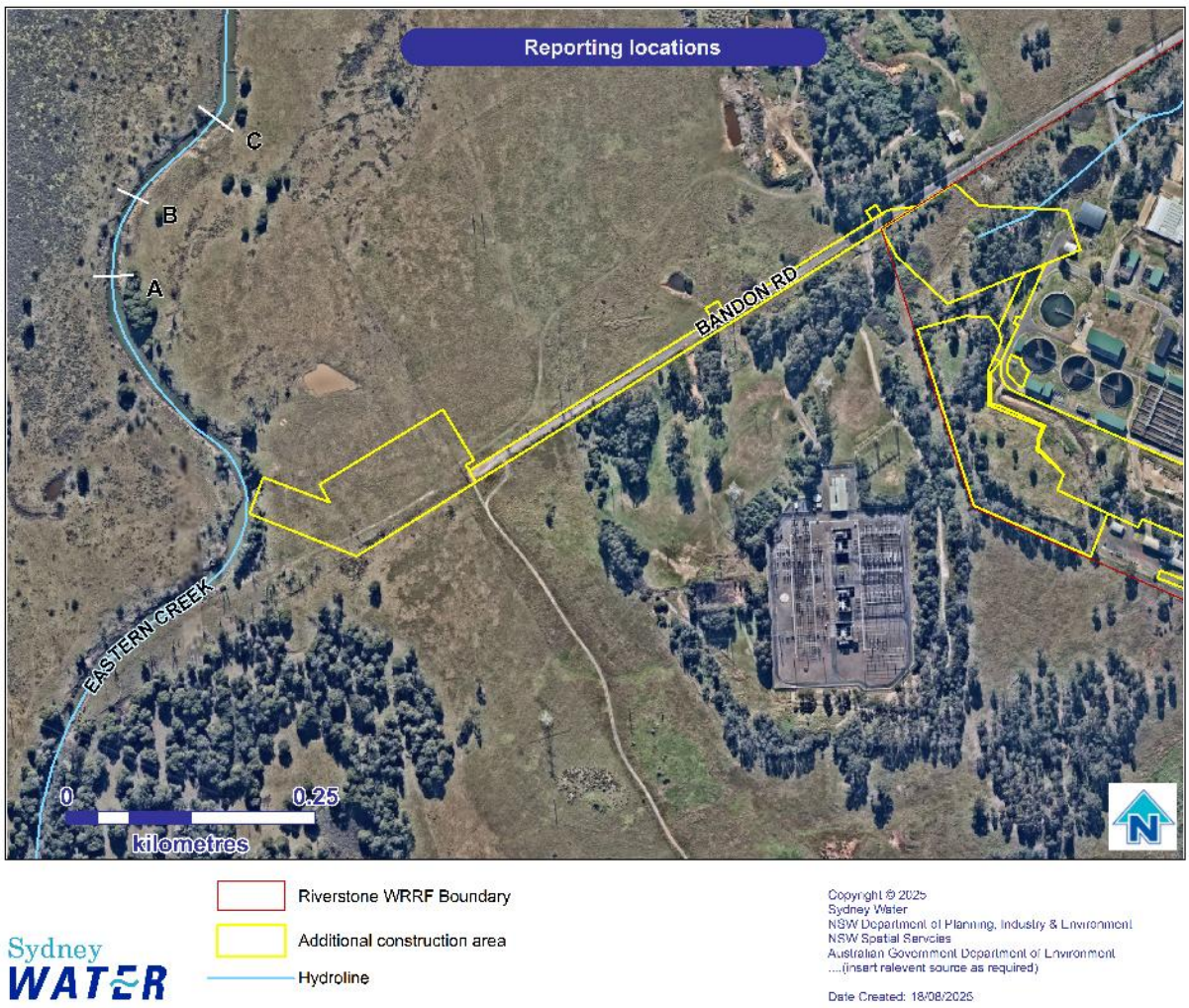

Figure 6-1 Ecohydrology and Geomorphology reporting locations

This assessment identified that there may be flow based barriers to the passage of native fish as a consequence of elevated velocities. These impacts are consistent with the Growth REF (2022). While the increased releases to Eastern Creek (assessed as part of this REFA) alter flow patterns downstream, near bank velocities and tail-waters are anticipated to be below the threshold for impact. Any impact to ecohydrology is expected to be short term while the waterway adjusts to a new equilibrium.

Impacts to geomorphology were measured by identifying the risk of erosion and macrophyte dislodgement in the receiving waterway. This was done using shear bed stress (the amount of energy required to dislodge sediment) as a metric of risk against particles of increasing size in the stream. Impacts to each location include:

- location A measured a low impact for small particles and negligible impact for particles cobble sized (64 mm) and larger
- location B measured a high impact to small particles and negligible impact to particles cobble sized and larger
- location C measured a high impact to small particles, moderate impact to particles of 1 mm and larger, and negligible impact to particles cobble sized and larger.

This assessment predicts that impacts are not likely at location A, while moderate to high shear stresses would be experienced at location B and C under the new conditions in the stream. This would result in short-term instability of the receiving waterway's physical form and the potential dislodgement and redistribution of macrophyte habitat or aquatic vegetation. However, any existing aquatic vegetation in the stream would reduce the likelihood of erosion impacts. The proposed mitigation measures would reduce the magnitude of these impacts, promoting stability and assisting the waterway as it settles into a new equilibrium.

Recommendations to ameliorate the potential impacts to ecohydrology and geomorphology from the increase in effluent discharge are largely equivalent to what was recommended in the Growth REF (2022). These measures emphasise monitoring the downstream environment for signs of additional erosion as well as potentially pre-emptive erosion control and stabilisation efforts. Examples of the proposed mitigation measures can be found in Appendix D.

Mitigation measures

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

Table 6-5 Environmental mitigation measures (operational) — Geomorphology and Ecohydrology

Mitigation measures
An adaptive management plan is recommended to ameliorate any observed impacts. This could include maintenance / planting of riparian vegetation along the creek banks, providing additional protection / stabilisation to creek features that are impacted.

Mitigation measures
Armouring of bed and banks as required to prevent propagation of any erosion upstream. Installation of revetments or other bank works to protect from erosion. Use of rockwork may provide long term erosion protection.
Monitor conditions for velocity. Construction of instream structures to concentrate velocities and produce low velocity corridors for fish passage. Introduction of large woody debris or rootwad revetments at near-bank locations to reduce velocities.

6.5 Flora and fauna

A Flora and Fauna assessment was completed by Biosis Pty Ltd in June 2025 for the proposed changes. The full report is in Appendix E.

Existing environment and potential impacts

Existing environment

Vegetation within the study area offers limited connectivity to remnant vegetation to the east and north and along the riparian corridor of Eastern Creek to the west. The flora and fauna assessment included a review of databases and relevant literature as well as a field investigation on 12 May 2025.

The vegetation throughout most of the proposal area has been modified by past disturbances which have included historical clearing and weed ingress via the introduction of horticultural plantings. Nonetheless, vegetation of the proposal area comprises of planted native vegetation, exotics and several plant community types (PCT) with associated threatened ecological communities (TECs). PCTs have been identified through field investigations and ground truthing. These PCTs and TECs are outlined in **Table 6-6**.

Table 6-6 Existing PCTs within the study area

PCT	PCT description	Associated TEC	Extent	Condition	Legislative listing
3320	Cumberland Shale Plains Woodland	Cumberland Plain Woodland in the Sydney Basin Bioregion	1.36 ha	Low and planted	EPBC Act and BC Act
3448	Castlereagh Ironbark Forest	Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion and Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	1.03 ha	Planted	EPBC Act and BC Act

4023	Coastal Valleys Swamp Oak Riparian Forest	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and south-east Corner Bioregions	0.32 ha	Low and planted	EPBC Act and BC Act

Eastern Creek is the only aquatic habitat nearby to the proposal area, running along its western boundary. Eastern Creek contained a series of pools typically 10 to 15 metres wide and 20 to 30 metres long, connected by small flowing channel sections. Pools were fringed by a mix of native riparian vegetation. Large sections of eroded bank were visible, indicative of poor bank stability during higher seasonal flow periods. This instability is considered a result of a combination of degraded riparian vegetation and increased flows associated with urbanisation and cattle grazing in the surrounding areas.

Background searches identified 28 threatened flora species, and 80 threatened fauna species recorded or predicted to occur within 5 kilometres of the proposal.

The field survey also identified the following threatened species and habitat (refer **Figure 6-2**):

- one *Grevillea juniperina* within the impact area (within certified land)
- three bat boxes for microbat habitat within the impact area.

The study area is located within the north-west growth area (NWGA), as identified under Chapter 3 of the Central River City SEPP. Under the Biodiversity Certification Order, which confers biodiversity certification on land mapped under the former Growth Centres SEPP, areas mapped as certified land do not require formal biodiversity assessment under the BC Act or the EPBC Act.

Potential impacts

The study area defined in **Figure 6-2** contains a mix of certified land, non-certified land, existing native vegetation (ENV) and areas located outside of the NWGA boundary.

The total clearing including the 2022 Growth REF and 2024 Growth REFA would include the following (refer **Figure 6-2**):

- The direct removal of 0.97 ha of non-certified land that has been identified as exotic pasture.
- The direct removal of 2.98 ha of exotic pasture outside of the NWGA.
- The direct removal of 0.12 ha of PCT 4023 (Swamp Oak Floodplain Forest EEC), which constitutes 0.12 ha of threatened Grey-headed flying Fox foraging habitat.
- The direct removal of 2.59 ha of certified native vegetation that conforms to PCT 3320, PCT 4023, PCT 3448.
- Direct impacts to the threatened *Grevillea juniperina* and three microbat bat boxes. Mitigation measures have been recommended to reduce impact to these.

PCT 3448 and PCT 4023 conform to habitat suitable for the Dural Land Snail and Cumberland Plain Land Snail.

Field investigations determined that while ENV was mapped as present within the proposal area, it did not meet the requirements and was validated as 'not ENV'. No areas of field validated ENV will be impacted by the proposed changes (refer **Figure 6-3**).

Tests of significance were completed for the Grey-headed Flying Fox (threatened species) and the Swamp Oak Floodplain Forest (threatened ecological community). Both tests determined that the proposed works are unlikely to significantly impact these species, and further assessment is not required.

A Significant Impact Criteria assessment was completed for one species under the EPBC Act, the Grey-headed Flying Fox. This test determined that the proposed works are not likely to significantly impact this species.

These conclusions were made on the basis that:

- impacts are minor, localised, and limited to small areas of foraging habitat
- entire habitat patches will not be removed
- large, intact vegetation areas will remain undisturbed, maintaining ecological function and connectivity.

This project will not result in a significant impact on threatened species, populations or communities listed under the BC Act and the EPBC Act.

Table 6-7 shows the required clearing of all vegetation types for the proposal and includes any offsetting required under the Sydney Water Biodiversity Offset Guideline.

Table 6-7 Vegetation clearing and offsetting

Vegetation classification	Certified vs non-certified	Amount to be cleared (ha)	Biodiversity offsets required?	Ratio
Exotic Pasture	Non-certified	0.97	no	n/a
Exotic Pasture	n/a	2.98	no	n/a
PCT 4023 Coastal Valleys Swamp Oak Riparian Forest	n/a	0.12	yes	3:1
PCT 3320 Cumberland Shale Plains Woodland	Certified	1.36	no	n/a
PCT 3448 Castlereagh Ironbark Forest	Certified	1.03	no	n/a
PCT 4023	Certified	0.20	no	n/a

Coastal Valleys Swamp
Oak Riparian Forest

About 2.71 ha of native vegetation would be cleared as part of the proposal. However, 2.59 ha of this vegetation is within certified land under the NWGA. Therefore, further assessment and offsetting of this 2.59 ha is not required.

As the proposed changes will not result in the clearance of any verified ENV, statutory offsetting is not triggered. However, as 0.12 ha of native vegetation (PCT 4023) is being cleared Sydney Water will fulfill offsetting under the Sydney Water Biodiversity Offset Guideline at a ratio of 3:1.

Figure 6-2 shows the key ecological features located in and around the construction area. The impact area is the expected area needed for vegetation clearing. **Figure 6-3** shows the ENV within the NWGA that has been validated by field investigations. The 'impact area' layer in the below figures corresponds to the vegetation impact layer in Figure 3-1.

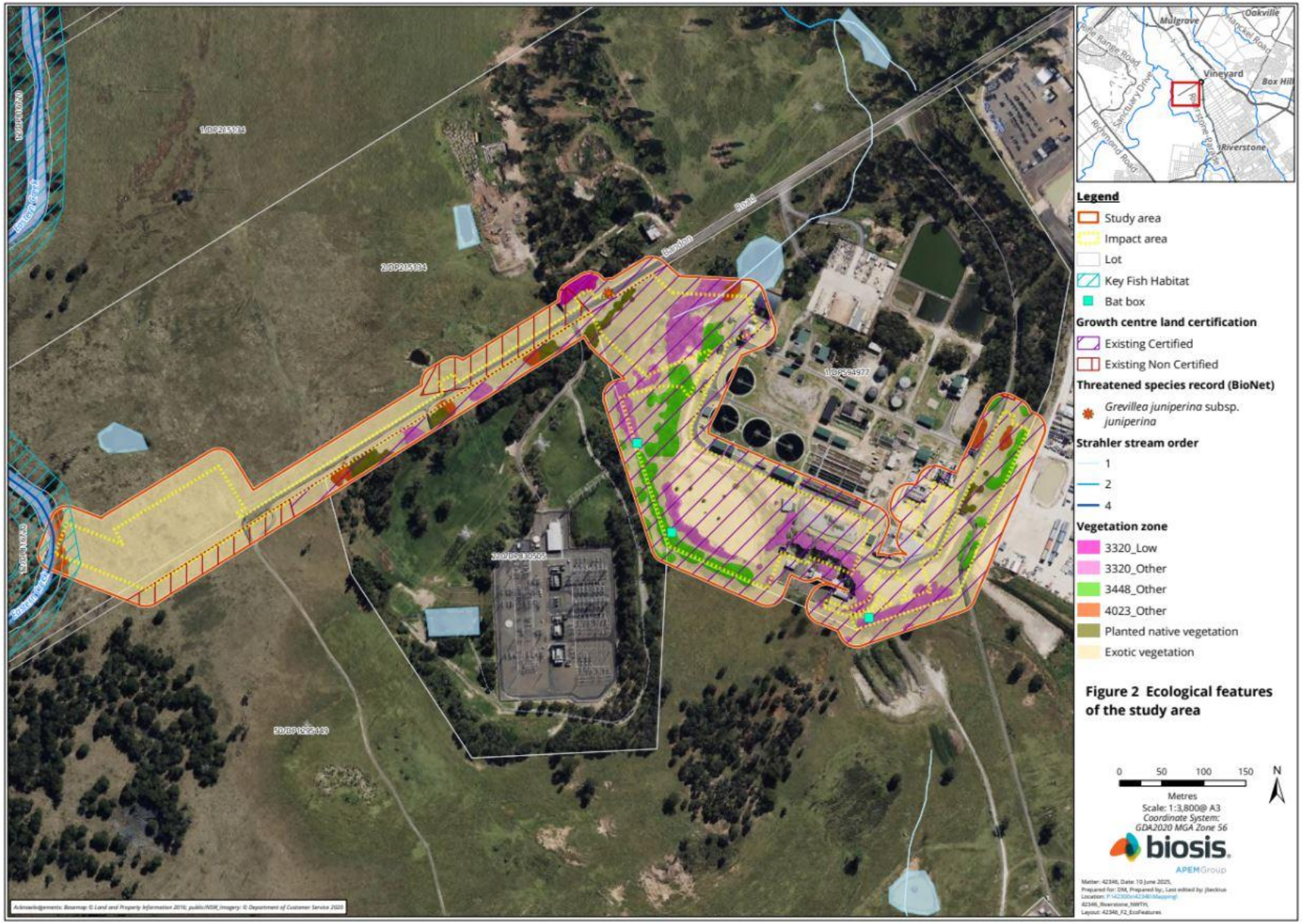

Figure 6-2 Ecological features of the proposal

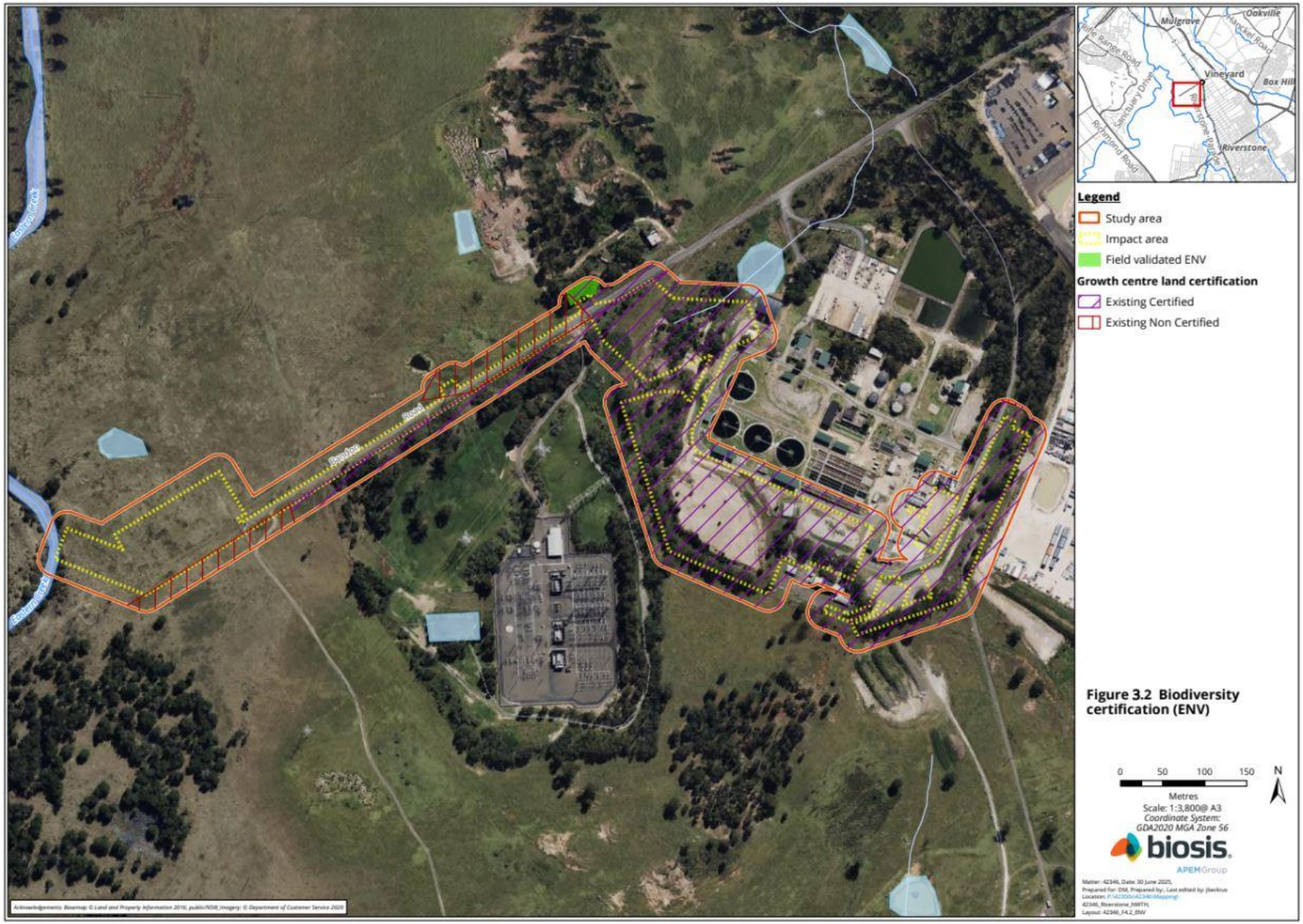

Figure 6-3 Field validated ENV (biodiversity certification)

Mitigation measures

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

Table 6-8 Environmental mitigation measures — flora and fauna

Mitigation measures
Minimise impacts on native vegetation in non-certified areas, native vegetation retention areas and areas outside the growth centre. Options to consider where feasible include: • Alternative construction methodologies (under bore vegetation and waterways, compressed construction corridors). • Avoiding impact to hollow bearing and habitat trees.
Pre-clearance inspections for Dural Land Snail and Cumberland Plain Land Snail in 'high quality habitat" would be extended to PCT 3448 and PCT 4023 as determined by project ecologist. High quality habitat is defined as areas with low levels of ground disturbance, with a moderate to high litter cover of bark, leaves and logs / woody debris, or grass clumps. If found, snails to be relocated to adjacent retained habitats by licensed ecologist.
All site personnel will be briefed during toolbox talks on ID characteristics of Grey-headed Flying Fox. They will also be instructed to immediately cease works if any individuals are observed roosting in vegetation scheduled for removal, and to notify the site supervisor or environmental representative.
If feasible, the individual Juniper-leaved Grevillea located within certified land can be salvaged and translocated to the offset area at the Riverstone WRRF. While not a legislative requirement, this measure may support retention of the species within the broader landscape. Any translocation should follow a translocation plan prepared by a suitably qualified ecologist and include appropriate site preparation, timing, and follow-up monitoring.
The existing microbat bat boxes within the WRRF should be relocated if required for removal. A suitable nearby retained vegetated area should be selected in consultation with an ecologist. The relocation should occur outside the maternity season (typically September to January), and an ecologist should inspect the box beforehand to confirm whether it is occupied and advise on timing.
Offsetting would be undertaken under the Sydney Water Biodiversity Offset Guideline for the clearance of 0.12 ha of native vegetation. This will be completed at a ratio of 3:1. Therefore, 0.36 ha of native vegetation will be offset.

6.6 Aboriginal heritage

An Aboriginal Heritage Due Diligence assessment was completed by Kelleher Nightingale Consulting Pty Ltd (KNC) in June 2025 to inform this REFA, in particular the additional construction footprint needed to construct the duplicate effluent discharge pipe.

The full report is in Appendix F.

Existing environment and potential impacts

The proposal was assessed under the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales ('Due Diligence Code of Practice') (DECCW, 2010). The AHDD included a review of background information, existing assessments, and database searches as well as a visual inspection of the site in May 2025.

The landscape assessment identified the presence of landforms considered archeologically sensitive under the Due Diligence Code of Practice, as the proposal is located near Eastern Creek. An initial review of the landform, soil landscapes, and hydrology of the locality support the likelihood of Aboriginal archeological potential.

A search on Aboriginal Heritage Information System (AHIMS) showed 11 Aboriginal sites recorded in or near the proposal. [redacted]

A review of previous investigations included several NWTH projects, however, no Aboriginal archeological sites were identified within the proposal area.

The visual inspection did not identify any Aboriginal objects, archaeological sites or areas of archaeological potential within the proposal area.

Landform and disturbance assessment found that historical and contemporary land use has led to high levels of disturbance due to road construction, existing water and electricity-related infrastructure and agricultural activity. The existing road corridor is a modified environment, and the floodplain has been disturbed by large-scale flood events. Based on this, potential impacts to Aboriginal Heritage are not anticipated during construction or operation and the works can proceed with caution.

Mitigation measures

With the implementation of the mitigation measures outlined in the Growth REF (2022) and Growth REFA (2024), impacts to Aboriginal heritage can be adequately managed, and residual impacts are expected to be low.

6.7 Noise and vibration

Existing environment and potential impacts

The existing environment for noise and vibration is consistent with what is outlined in the addendum Noise and Vibration Impact Assessment (NVIA) completed as part of the Growth REFA (2024). This NVIA used background noise data collected in 2022, during preparation of the Growth REF (2022). Due to the length of time elapsed since collection of data, as well as ongoing development in the area, updated baseline noise monitoring was completed in August 2025 (Appendix G). This included an increase in background noise in NCA 1 for daytime, evening and nighttime noise levels.

There are currently construction works underway and there will be some overlap when construction for the proposed changes commence. However, given the distance to the nearest receivers (300 metres) we do not anticipate substantial cumulative impacts.

Construction impacts

A quantitative noise and vibration impact assessment was completed using the Transport for NSW Construction and Maintenance Noise Estimator (transport estimator) for the proposed change according to guidelines in the Interim Construction Noise Guideline (DECC 2009).

The noise assessment was conducted as a worst-case distance-based assessment using the bulk earthworks scenario.

The surrounding residential area around the Riverstone WRRF was assigned noise catchment area 1 (NCA1) in the Growth REFA (2022).

The transport estimator assigns background noise levels based on a generalisation of infrastructure and landscape that surround the noisy activities. This is called the representative noise environment. The representation that most closely fit the updated background noise is representative noise environment 1 (R1). **Table 6-9** outlines details of the previous and updated Background Noise Levels (RBLs) and Noise Management Levels (NMLs) that correspond to R1.

The RBL for R1 has been used in the updated noise assessment as a conservative approach for this REFA. However, actual RBL (2025 monitoring) could be used for compliance monitoring during construction and NMLs have been based on the 2025 monitoring.

Table 6-9 Background Noise Levels and Construction Noise Management Levels for the proposal

Period	RBL L_{A90} dB(A) 2022 REF	RBL (from the Estimator) R1	RBL L_{A90} dB(A) 2025 monitoring	NML (2025 monitoring)
Day	37	40	43	53
Evening	33	35	38	43
Night	30	30	31	36

All major works are expected to be carried out within standard day hours (Monday to Friday 7am – 6pm, Saturday 8am – 1pm). As such only day works are being assessed using the estimator.

Minor out of hours works may be required for concrete pours and the tie in/cutover for the discharge pipeline. These works would be assessed against the updated baseline noise monitoring (2025 monitoring) and undertaken as needed in accordance with the mitigation measures outlined in the Growth REF (2022).

The construction scenario anticipated to generate the most 'noisy works' was the bulk earthworks scenario. Sensitive receivers close to the Riverstone WRRF include residential receivers to the east of Riverstone Parade along Otago St, Norwood Rd, Ashford Rd, and Camberwell Rd as well

as residences along Bandon Road, St James Road, and Wallace Rd as shown in **Figure 6-4** and **Figure 6-5**.

Non-residential receivers close to the Riverstone WRRF include small businesses on Bandon Rd and Norwood Rd and shown in **Figure 6-4** and **Figure 6-5**.

Upgrade works within the WRRF

The proposed changes within the WRRF boundary would not have line of sight to any sensitive receivers as the facility is surrounded by an earth mound (for flood protection purposes). The development over the existing stockpile is within this earth mound and would not alter any noise patterns or line of sight. Therefore, noise impacts can be summarised by the following **Table 6-10**.

Table 6-10 Potential noise impacts for upgrade works within the WRRF boundary

	$L_{Aeq\ (15\ minute)}$ noise level above background (L_{A90})				
	Affected distance (m)	Moderately intrusive 20 to 30 dB(A)		Highly intrusive > 30 dB(A)	
		Within distance (m)	Mitigation measures	Within distance (m)	Mitigation measures
Undeveloped green fields	280	115	Notification	35	Notification, Phone calls, Respite offer

The impact distances for upgrade works within the WRRF boundary are outlined in **Table 6-10**. There are no sensitive receivers within this potentially impacted zone as shown in **Figure 6-4**.

Duplicate effluent discharge pipe

The proposed pipeline is not within the WRRF boundary and sensitive receivers would have line of sight to the works. Noise impacts are summarised in **Table 6-11**.

Table 6-11 Noise impacts for the duplicate effluent discharge pipe

	$L_{Aeq\ (15\ minute)}$ noise level above background (L_{A90})				
	Affected distance (m)	Moderately intrusive 20 to 30 dB(A)		Highly intrusive > 30 dB(A)	
		Within distance (m)	Mitigation measures	Within distance (m)	Mitigation measures
Undeveloped green fields	635	280	Notification	115	Notification, Phone calls, Respite offer

Figure 6-4 Noise impacts for upgrade works within the WRRF boundary

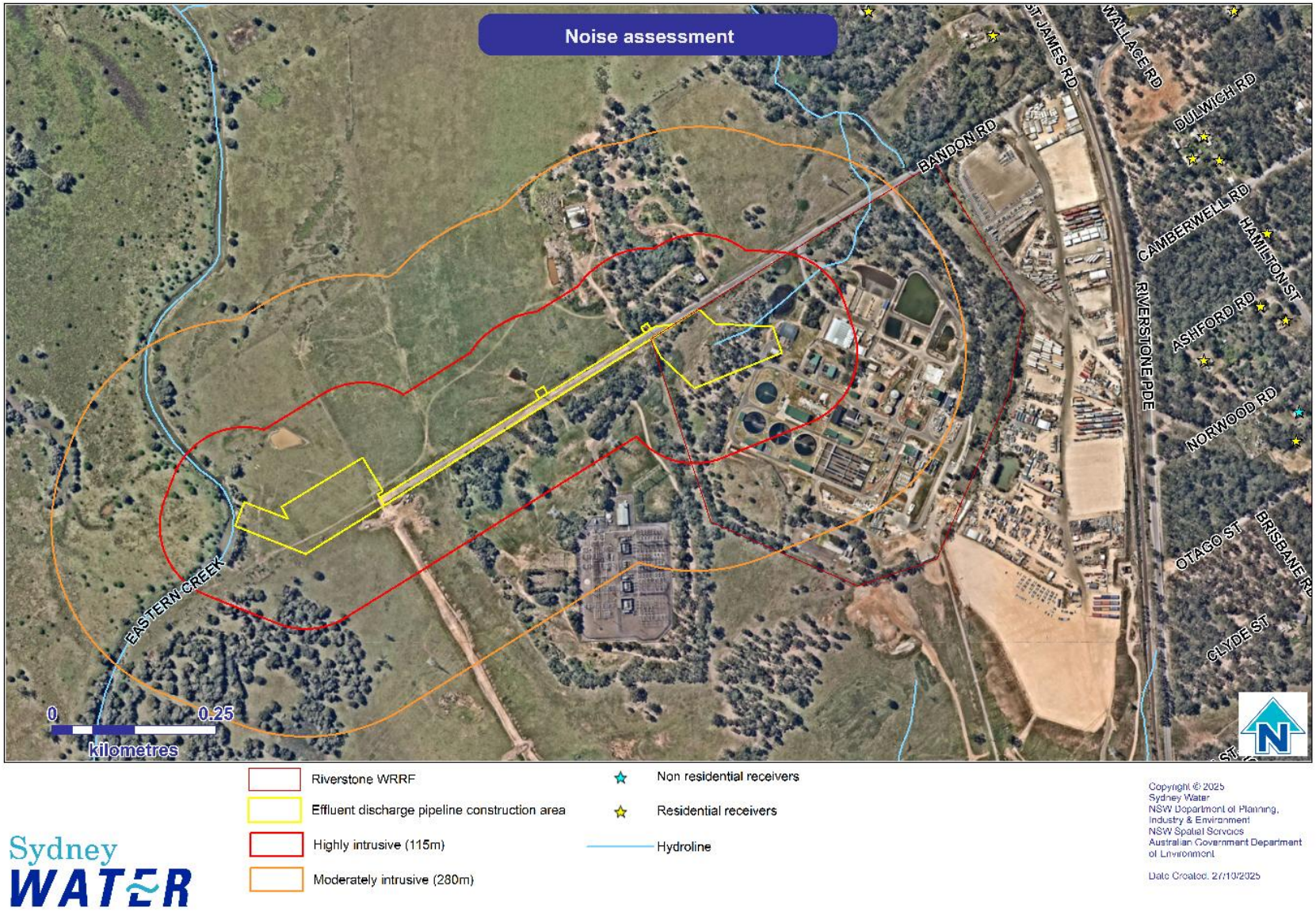

Figure 6-5 Noise impacts for the duplicate effluent discharge pipe

As shown in both **Figure 6-4** and **Figure 6-5**, all nearby sensitive receivers (both residential and non-residential) are outside the buffer areas for noise impacts. While works may be audible from these residences and businesses, noise impacts would be minimal and additional mitigation measures are not required.

Vibration impacts

The proposal would generate vibration during construction. There are no additional plant/equipment anticipated to be used during construction of the proposed changes that would trigger vibration impacts. Vibration impacts and minimum safe working distances are consistent with those outlined in the Growth REF (2022).

Operational impacts

Operational noise modelling was undertaken as part of the Growth REFA (2024) to reflect changes to operation noise. This used the baseline background noise from the Growth REF (2022) as the criteria. The criteria has been updated to reflect the updated baseline noise monitoring undertaken in 2025 as part of this REFA.

Updated noise monitoring undertaken at 6 Ashford Road resulted in an increase in background noise for NCA 1. This address, being closest to the works, has been used as the worst-case scenario to reflect the updated operational noise criteria as shown in Table 6-12.

Under adverse weather conditions (worst case scenario), an exceedance of 1 dB is predicted at one of the identified receivers around the Riverstone WRRF during the night-time. However, with the recommended noise attenuation treatments in place (as documented in Growth REF 2022), existing facility equipment will typically dominate the predicted noise levels, and the exceedance is negligible (less than 2 dB is unlikely to be discernible to the human ear).

Table 6-12 Predicted operational noise levels

Location	Distance from WRRF (m)	Sound pressure level, L_{Aeq} dB(A)					
		Previous noise levels (2022)	Existing noise levels (2024)	Previous criteria (2024)	Updated Criteria (2025)	Exceedance	Increase
Daytime - Neutral weather							
6 Ashford Road	320	33	36	42	48	-	3
Night-time – Neutral weather							
6 Ashford Road	320	33	34	35	36	-	1
Daytime – Adverse weather							
6 Ashford Road	320	36	39	42	48	-	3

Location	Distance from WRRF (m)	Sound pressure level, L_{Aeq} dB(A)					
		Previous noise levels (2022)	Existing noise levels (2024)	Previous criteria (2024)	Updated Criteria (2025)	Exceedance	Increase
Night-time – Adverse weather							
6 Ashford Road	320	36	37	35	36	1	1

Mitigation measures

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

Table 6-13 Environmental mitigation measures — noise and vibration

Mitigation measures
Operational noise monitoring would be undertaken during commissioning of the completed works to determine operational impacts on the surrounding environment and make sure operational noise levels for the WRRF have been achieved (as assessed in the Growth REFA (2024)).

6.8 Waste management

Existing environment and potential environmental impacts

Further assessment of the south-west stockpile determined that while 2 asbestos fragments were found, this would not affect the suitability of the stockpile for reuse, under the assumption that further assessment be undertaken prior to disturbance. The appropriate controls (refer Section 6.2) would be adopted to manage any future instances or evidence of hazardous material that may be encountered.

There is no change to wastewater solid streams as part of the proposed change.

Construction impacts

Our corporate objectives include to be a resource recovery business with an increasing portfolio of circular economy products and services. This includes reducing waste through recycling and re-use and encouraging our suppliers to minimise waste. Opportunities to reduce, recycle and reuse materials will be sought prior to and during delivery and documented in the Waste Management Plan or CEMP.

Expected waste to be generated is likely to be:

- excavated rock and spoil that is deemed unsuitable for reuse onsite, such as for backfilling excavations

- uncontrolled fill material with including contaminated materials
- vegetation waste from clearing activities
- demolition waste from existing structures with the potential to contain hazardous building materials (HBM)
- general construction waste.

The proposed changes involve the construction of expanded facilities and batters that will require excavations and/or the movement of material.

The following facilities will require excavations:

- fine screens
- stage 1 MBR and bioreactor overburden
- flow distribution chamber and flow meter
- bioreactor and MBR
- all other facilities foundations including permeate pumps and tanks, chem dosing, LV, blower
- yard piping
- effluent pipeline
- roads, drainage and landscaping.

Potential impacts include uncovering unknown contamination during excavations on site. This can be managed through the preparation of a Detailed Site Investigation (DSI). The primary objective of the DSI is to identify contamination (if any) within the project footprint and assess the human and environmental health risks associated with the proposed development. Potential impacts associated with the above waste streams have been outlined in the Growth REF (2022). Potential impacts associated with the proposed changes are consistent with those outlined in the Growth REF (2022) and Growth REFA (2024), under the assumption that previously recommended safeguards are carried out for the additional areas.

Operational impacts

Operational impacts associated with the proposed changes are anticipated to be consistent with those outlined in the Growth REF (2022) and Growth REFA (2024).

Mitigation measures

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

Table 6-14 Environmental mitigation measures — waste and hazardous materials

Mitigation measures
A Waste Management Plan must be developed for the project. If any waste is disposed offsite, it must be classified in accordance with the NSW EPA waste classification guidelines. Waste must only be disposed at a facility licenced to accept the waste type. Tipping dockets must be retained and depending on the waste type, consignment, authorisations, and transportation certificates may be required prior to mobilisation of soils offsite.
A contaminated land Detailed Site Investigation (DSI) must be prepared for the project. The DSI must assess any area of the project where ground disturbance is proposed and must consider the findings of the Aurecon Preliminary Site Investigation (PSI). The DSI must be prepared in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended in 2013 (NEPM), and the *NSW EPA (2020) Guidelines for Consultants Reporting on Contaminated Land*. The DSI must be prepared by an appropriately experienced independent Environmental Consultant. The findings of the DSI should be used to develop and update the Waste Management Plan.

6.9 Traffic and access

Existing environment and potential impacts

Construction impacts

Construction of the effluent pipeline would require excavation along Bandon Road (council owned) between the WRRF access road and the southwest end. Council was notified of the proposal in August 2025 and have not raised any comments.

Typical construction periods would require up to 85 workers per day with up to 150 workers during peak construction periods. Traffic movements for workers are expected to be consistent with updated numbers in the REFA (2024).

Traffic requirements for spoil management and material movement are expected to increase to account for excavations and earthworks for the larger construction footprint associated with the proposed changes. This includes haulage for construction materials (mixed demolition), crushed concrete, asphalt, and waste.

The Growth REF (2022) indicated a possible 20 trucks per hour at Riverstone WRRF during construction. The increase in vehicle traffic is not anticipated to strain traffic conditions in the local area. Parking impacts would remain as outlined in the Growth REF (2022) as workers would be accommodated onsite.

Traffic control would not be needed for vehicles entering or leaving the facility but would be required within the facility when delivering equipment and/or materials for the additional works. A traffic management plan would be developed and implemented for the scope of works. The need for an ROL has been recommended in the approved Growth REF (2022).

Access to a private property is required to construct the duplicate effluent discharge pipeline. This is a rural property with livestock. Ongoing consultation with the landowner would facilitate access to ensure access impacts and livestock are appropriately managed.

Operational impact

Traffic and access impacts are not anticipated to substantially change from those outlined in the Growth REF (2022). General operations of the facility would see vehicle movements for staff and some heavy vehicle movements.

Mitigation measures

With the implementation of the mitigation measures outlined in the Growth REF (2022) and Growth REFA (2024), the impacts to traffic and access as a result of the proposed changes are anticipated to be low.

Table 6-15 Environmental mitigation measures — traffic and access

Mitigation measures
A Traffic Management Plan (TMP) will be developed and implemented for the works in consultation with the relevant authorities.
Access will be facilitated through consultation with the landowner to make sure livestock and access impacts are well managed during construction of the duplicate effluent discharge pipeline.

6.10 Social and visual

Existing environment and potential impacts

Construction impacts

Social and visual construction impacts are consistent with the Growth REF (2022) and Growth REFA (2024).

Operational impacts

The proposed changes will result in the construction of expanded buildings and facilities. However, these additional structures would be within the property boundary of the WRRF and would be unlikely to impact visual amenity as they are consistent with the scale of existing structures. The WRRF facility is surrounded by an earth mound on the south and west sides, as well as vegetation from the north and the storage facility from the east. These act as barriers to obscure vision from the locals or visitors in the area from public roads and residences nearby.

The construction of the secondary treatment facility as well as trenching for the effluent pipeline would require the removal of several mature trees (refer Section 6.5). This may impact visual amenity for outside residents looking into the facility however line of sight for residential properties is already obstructed to these areas by the general landform and other vegetation.

The effluent pipeline constructed outside of the property boundary would be buried and the surface would be returned to prior condition, with the exception of manholes for maintenance access. Therefore, visual or social impacts are not likely during operation.

A landscaped mound would be developed using the spoil re-located from the existing stockpile in the south-west of the WRRF. This spoil would need to be moved for construction of the expanded secondary treatment works area. This mound would be landscaped and would obscure any visible construction from potential viewers on Bandon Road.

Mitigation measures

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

Table 6-16 Environmental mitigation measures — social and visual

Mitigation measures
A visual mound would be developed in the south-west corner of the facility adjacent to the additional secondary treatment works area. This visual screen would act to block the additional works from possible viewers on Bandon Road.

6.11 Odour

Existing environment and potential impacts

Construction impacts

Odour construction impacts are consistent with the Growth REF (2022) and Growth REFA (2024).

Operational impacts

Odour modelling was completed as part of the Growth REF (2022). This identified that the odour zone (the area in which odour may affect nearby receivers) did not encroach on existing residential receivers under the Riverstone Precinct, Indicative Layout Plan (DPIE, 2010).

New MBRs introduce a potential new odour source. Updated modelling was completed by WSP (2026) to quantify the potential odour impacts from the new MBRs (refer Appendix I). Modelling results show odour contours of 2 OU and 4 OU for two scenarios: baseline (Growth REF, 2022), and the predicted odour contours (2026).

Changes in the odour dispersal pattern are shown in **Figure 6-6**. While odour dispersion does extend outside the WRRF, the modelled 2 OU contour is contained within industrial and infrastructure land zones. The changes include a minor expansion (to the southwest and northeast) as well as a minor contraction (to the northwest and southeast) of the odour contours. The model uses a worst-case scenario over 1 hour during adverse weather conditions (south westerly winds). These new contours do not reach nearby sensitive receivers.

The 2026 model supersedes the 2024 model that was completed as part of the 2024 Growth REFA, which assessed the carbonisation process.

The changes from the baseline are nominal and operation of the WRRF will comply with the EPA assessment criteria. The relevant criteria for the 2 OU and 4 OU contours are 'Urban' (>2000 people) and 'industrial land zones' (~125 people) respectively (refer table 6-17).

Table 6-17 EPA air quality assessment criteria for odour

Population of affected community	Criterion (odour units) (nose response time average, 99th percentile)
Single residence (≤ ~2)	7
~10	6
~30	5
~125 (industrial land zones)	4
~500	3
Urban (>2000 and/or schools and hospitals)	2

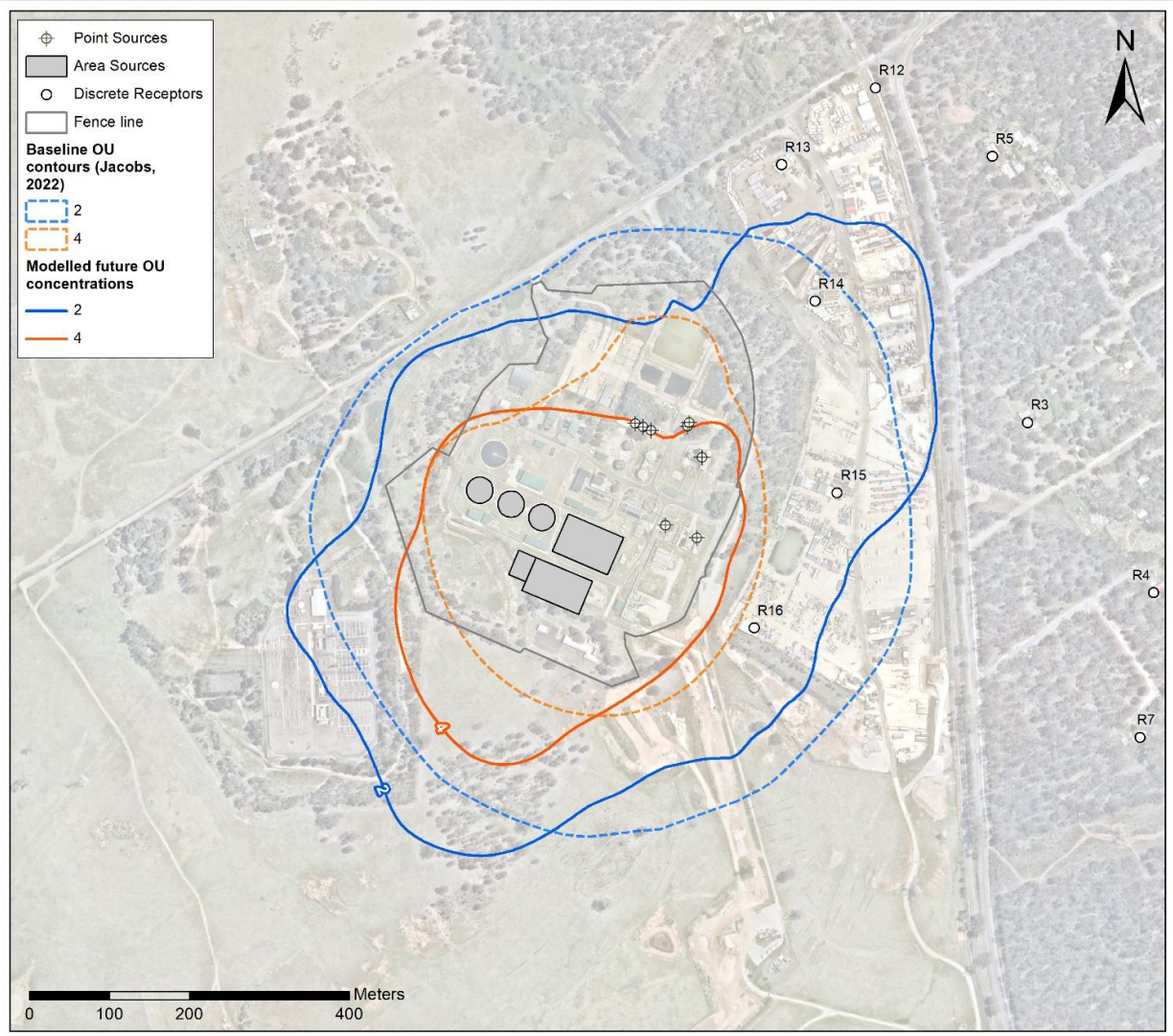

Figure 6-6 Odour dispersion modelling

Mitigation measures

With the implementation of the mitigation measures outlined in the Growth REF (2022) and Growth REFA (2024), impacts to odour can be adequately managed, and residual impacts are expected to be low.

7 Conclusion

Sydney Water has prepared this REFA to assess the potential environmental impacts of the North West Treatment Hub (Growth Package) Riverstone WRRF Liquid Amplification Works. The proposal is required to successfully service increased demand for wastewater treatment because of population and infrastructure growth in the region.

The main potential construction environmental impacts of the proposal relate to biodiversity. During operation, the potential impacts are associated with water quality and geomorphology. Given the nature, scale and extent of impacts and implementation of the mitigation measures outlined in this REF Addendum, the proposal is unlikely to have a significant impact on the environment. Therefore, an environmental impact statement is not required under Division 5.1 of the EP&A Act.

The REFA considers how the proposal aligns 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.

References

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

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

WaterNSW 2022, Neutral or Beneficial Effect on Water Quality Assessment Guideline, WaterNSW, NSW

Sydney Water 2022 Review of Environmental Factors (REF), North West Treatment Hub Plant Upgrades and Sludge Transfer System (Growth Package), Sydney Water

Sydney Water 2024 Review of Environmental Factors (REF) Addendum, North West treatment Hub Updates (Growth Package) Biosolids Processing and Construction Compound, Sydney Water

Appendices

Appendix A – Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	There may be short-term impacts on a private landowner during construction of the duplicate effluent discharge pipeline. There will be environmental improvements by continuing to provide a reliable wastewater service to the local community. The south-west stockpile will be relocated to create a visual screen, this will not impact the community or the environment and will be managed according to the mitigation measures.
Any transformation of a locality	The proposal will not result in the transformation of a locality. The main works are occurring on an existing WRRF, and the effluent pipeline will be installed underground.
Any environmental impact on the ecosystems of the locality	The proposal will result in environmental impacts to ecosystems of the locality. The proposed changes would result in the clearing of 0.12 ha of native vegetation outside certified land. However, the flora and fauna assessment determined this impact is unlikely to be significant. Other vegetation will be cleared for the proposal. However, this is on certified land within the north-west growth area. The proposal will lead to environmental improvements by continuing to provide a reliable wastewater service to collect and treat wastewater, minimising any impacts on the ecosystem.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposal will not reduce the aesthetic, recreational, scientific or other environmental quality or value of the locality. While vegetation clearing will occur it has been reduced to smallest possible amount and offsetting will occur for any native vegetation that is to be removed.
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	The proposal will not have any effect 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.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposal may have a minor impact on the habitat of protected animals. The proposed changes will result in the clearing of 0.12 ha of habitat for a threatened species, the assessment determined that this impact would not be significant. Other native vegetation that may be considered habitat for native fauna would be cleared for the proposal; however, this is on certified land within the north-west growth area.

Section 171 checklist	REF finding
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	The proposal will not be endangering any species of animal, plant or other form of life, whether living on land, in water or in the air. ToS and SIC assessments were undertaken for threatened species likely to occur at the proposed change site. The assessments show that this proposed change does not have a significant impact on these species and therefore does not endanger any of the species.
Any long-term effects on the environment	The proposal will not have any long-term impacts on the environment but will have a long-term benefit by providing a reliable and modern wastewater service for the area. The improved treatment capacity will service future growth of the area.
Any degradation of the quality of the environment	The proposal will not cause the degradation of the quality of the environment.
Any risk to the safety of the environment	The proposal will not increase risk to the safety of the environment. There will be a small increase in truck movements during construction. Consultation and signage during construction will mitigate this potential safety risk.
Any reduction in the range of beneficial uses of the environment	The proposal will not reduce the range of beneficial uses of the environment.
Any pollution of the environment	Environmental mitigation measures will mitigate the potential for the proposal to pollute the environment. The proposal will operate in accordance with EPL 1796.
Any environmental problems associated with the disposal of waste	Waste disposal will be in accordance with the environmental mitigation measures, and no environmental problems associated with the disposal of waste are expected.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposal will not increase demand on resources, that are, or are likely to become, in short supply.
Any cumulative environmental effect with other existing or likely future activities	The proposal will not have any cumulative environmental effect with other existing or likely future activities.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The proposal will not have any impact on coastal processes or hazards, and coastal processes and coastal hazards will not have any impact on the proposed change.
Any applicable local strategic planning statements, regional strategic plans or	The proposed change services growth aligned with the applicable strategic context. This was considered in the system planning

Section 171 checklist	REF finding
district strategic plans made under the EP&A Act, Division 3.1	and options selection process (refer to Section 2.2 of the Growth REF) and is discussed in Section 5.1 of this REFA.
Any other relevant environmental factors.	The proposal has been assessed against the factors listed above, and there are no other relevant environmental factors to consider.

Appendix B – Section 171A checklist

Biodiversity and Conservation SEPP Section		Yes	N/A
Regulated Catchments			
Water quality and quantity			
6.6 (1)	Has Sydney Water considered:		
	(a) whether the development will have a neutral or beneficial effect on the quality of water entering a waterway *Water quality impacts are assessed in Section 6.3. There will be an increase in nutrient loads to Eastern Creek. However, this is needed to service growth in the catchment and this facility will operate in accordance with the relevant EPL.*	☒	☐
	(b) whether the development will have an adverse impact on water flow in a natural waterbody *Water quantity impacts are assessed in Section 6.4. There will be additional flows to Eastern Creek. However, this is needed to service growth in the catchment and this facility will operate in accordance with the relevant EPL.*	☒	☐
	(c) whether the development will increase the amount of stormwater run-off from a site *Construction of additional infrastructure will create more hardstand area contributing to additional runoff. This runoff will be transferred to head of works and treated by the facility.*	☒	☐
	(d) whether the development will incorporate on-site stormwater retention, infiltration or reuse	☐	☒
	(e) the impact of the development on the level and quality of the water table *A water supply works approval (WSWA) will be developed for the works to manage groundwater impacts during construction. No long term impacts are anticipated.*	☒	☐
	(f) the cumulative environmental impact of the development on the regulated catchment *Water quality modelling has assessed all catchment inputs (refer Section 6.3).*	☒	☐
	(g) whether the development makes adequate provision to protect the quality and quantity of ground water. *Refer to (e)*	☒	☐
6.6 (2)	Is Sydney Water satisfied that:		

Biodiversity and Conservation SEPP Section		Yes	N/A
	(a) the effect on the quality of water entering a natural waterbody will be as close as possible to neutral or beneficial, and	☒	☐
	(b) the impact on water flow in a natural waterbody will be minimised.	☒	☐
Aquatic ecology			
6.7 (1)	Has Sydney Water considered:		
	(a) whether the development will have a direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation, *Refer to section 6.4 and section 6.5*	☒	☐
	(b) whether the development involves the clearing of riparian vegetation and, if so, whether the development will require—		
	(i) a controlled activity approval under the *Water Management Act 2000*, or	☐	☒
	(ii) a permit under the *Fisheries Management Act 1994*,	☐	☒
	(c) whether the development will minimise or avoid—		
	(i) the erosion of land abutting a natural waterbody, or	☒	☐
	(ii) the sedimentation of a natural waterbody,	☒	☐
	(d) whether the development will have an adverse impact on wetlands that are not in the coastal wetlands and littoral rainforests area,	☐	☒
	(e) whether the development includes adequate safeguards and rehabilitation measures to protect aquatic ecology,	☒	☐
	(f) if the development site adjoins a natural waterbody—whether additional measures are required to ensure a neutral or beneficial effect on the water quality of the waterbody.	☒	☐
6.7 (2)	Is Sydney Water satisfied that:		
	(a) the direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation will be kept to the minimum necessary for the carrying out of the development,	☒	☐
	(b) the development will not have a direct, indirect or cumulative adverse impact on aquatic reserves,	☒	☐
	(c) if a controlled activity approval under the *Water Management Act 2000* or a permit under the *Fisheries Management Act 1994* is required in relation to the clearing of riparian vegetation—the approval or permit has been obtained,	☐	☒
	(d) the erosion of land abutting a natural waterbody or the sedimentation of a natural waterbody will be minimised,	☒	☐

Biodiversity and Conservation SEPP Section		Yes	N/A
	(e) the adverse impact on wetlands that are not in the coastal wetlands and littoral rainforests area will be minimised.	☐	☒
Flooding			
6.8 (1)	Has Sydney Water considered:		
	The likely impact of the development on periodic flooding that benefits wetlands and other riverine ecosystems?	☒	☐
6.8 (2)	Are the works on flood liable land? If yes, is Sydney Water satisfied that the development will not:		
	(a) if there is a flood, result in a release of pollutants that may have an adverse impact on the water quality of a natural waterbody, or	☒	☐
	(b) have an adverse impact on the natural recession of floodwaters into wetlands and other riverine ecosystems.	☐	☒
Recreation and public access			
Note: This section (6.9) does not apply if the works are in a special area under the *Water NSW Act 2014*.			
6.9 (1)	Has Sydney Water considered:		
	(a) the likely impact of the development on recreational land uses in the regulated catchment, and	☐	☒
	(b) whether the development will maintain or improve public access to and around foreshores without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation.	☐	☒
6.9 (2)	Is Sydney Water satisfied:		
	(a) the development will maintain or improve public access to and from natural waterbodies for recreational purposes, including fishing, swimming and boating, without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation,	☐	☒
	(b) new or existing points of public access between natural waterbodies and the site of the development will be stable and safe,	☐	☒
	(c) if land forming part of the foreshore of a natural waterbody will be made available for public access as a result of the development but is not in public ownership—public access to and use of the land will be safeguarded.	☐	☒
Sydney Drinking Water Catchment			
Note: Section 6.6 (1) (a) or 6.6 (2) (a) does not apply if the activity is in the Sydney Drinking Water Catchment.			
171A (3)	For works in the Sydney Drinking Water Catchment, has Sydney Water also taken into account whether the activity: (i) will have a neutral or beneficial effect on water quality, and	☐	☒

Biodiversity and Conservation SEPP Section		Yes	N/A
	(ii) is consistent with the NorBE Guideline within the meaning of *State Environmental Planning Policy (Biodiversity and Conservation) 2021*, Part 6.5		
Sydney Harbour Catchment			
6.28 (1)	Has Sydney Water considered:		
	(a) whether the development is consistent with the following principles— (i) Sydney Harbour is a public resource, owned by the public, to be protected for the public good, (ii) the public good has precedence over the private good, (iii) the protection of the natural assets of Sydney Harbour has precedence over all other interests,	☐	☒
	(b) whether the development will promote the equitable use of the Foreshores and Waterways Area, including use by passive recreation craft,	☐	☒
	(c) whether the development will have an adverse impact on the Foreshores and Waterways Area, including on commercial and recreational uses of the Foreshores and Waterways Area,	☐	☒
	(d) whether the development promotes water-dependent land uses over other land uses,	☐	☒
	(e) whether the development will minimise risk to the development from rising sea levels or changing flood patterns as a result of climate change,	☐	☒
	(f) whether the development will protect or reinstate natural intertidal foreshore areas, natural landforms and native vegetation,	☐	☒
	(g) whether the development protects or enhances terrestrial and aquatic species, populations and ecological communities, including by avoiding physical damage to or shading of aquatic vegetation,	☐	☒
	(h) whether the development will protect, maintain or rehabilitate watercourses, wetlands, riparian lands, remnant vegetation and ecological connectivity.	☐	☒

Appendix C – Consideration of TISEPP consultation

TISEPP section	Yes	No
Section 2.10, council related infrastructure or services – consultation with council		
Will the work:		
Potentially have a substantial impact on stormwater management services provided by council?		X
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		X
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		X
Connect to, and use a substantial volume of water from a council owned water supply system?		X
Require temporary structures on, or enclose, a public space under council's control that will disrupt pedestrian or vehicular traffic that is not minor or inconsequential?		X
Excavate a road, or a footpath adjacent to a road, for which the council is the roads authority, that is not minor or inconsequential?	X	
Section 2.11, local heritage – consultation with council		
Is the work likely to affect the heritage significance of a local heritage item, or of a heritage conservation area (not also a State heritage item) more than a minor or inconsequential amount?		X
Section 2.12, flood liable land – consultation with council		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and will works alter flood patterns other than to a minor extent?		X
Section 2.13, flood liable land – consultation with State Emergency Services		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and undertaken under a relevant provision*, but not the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance? * (e) Div.14 (Public admin buildings), (g) Div.16 (Research/ monitoring stations), (i) Div.20 (Stormwater systems)?		X
Section 2.14, development with impacts on certain land within the coastal zone– council consultation		
Is the work on land mapped as coastal vulnerability area and inconsistent with a certified coastal management program?		X
Section 2.15, consultation with public authorities other than councils		
Will the proposal be on land adjacent to land reserved under the *National Parks and Wildlife Act 1974* or land acquired under Part 11 of that Act*? If so, consult with DPE (NPWS).*		X
Will the proposal be on land in Zone C1 National Parks and Nature Reserves or on a land use zone that is equivalent to that zone? *If so, consult with DPE (NPWS).*		X
Will the proposal include a fixed or floating structure in or over navigable waters? *If so, consult TfNSW.*		X
Will the proposal be on land in a mine subsidence district within the meaning of the *Coal Mine Subsidence Compensation Act 2017*? *If so, consult with Subsidence Advisory NSW.*		X
Will the proposal be on land in a Western City operational area specified in *the Western Parkland City Authority Act 2018,* Schedule 2 and have a capital investment value of $30 million or more? *If so, consult the Western Parkland City Authority*.		X

Will the proposal clear native vegetation on land that is not subject land (ie non-certified land)? *If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).*		X

Appendix D – Water Quality and Hydrodynamics assessment

Appendix E – Flooding, geomorphology, and Ecohydrology assessment

Appendix F – Flora and Fauna assessment

Appendix G – Aboriginal Heritage Due Diligence assessment

Appendix H – Updated Baseline Noise Monitoring

Appendix I – Air Quality Impact Assessment