Review of Environmental Factors

Prospect Pre-treatment Plant Augmentation and Upgrade – Package 1 (February, 2025)

Sydney WATER



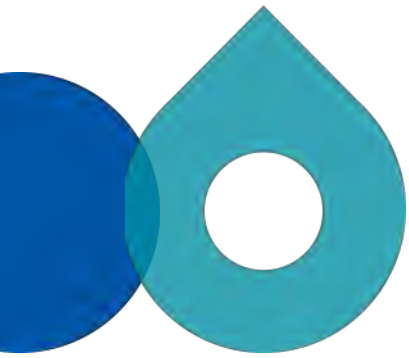
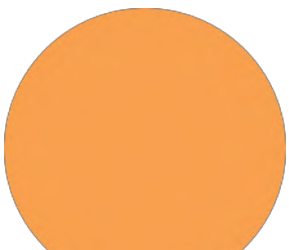

Table of contents

Figures

Tables

Acknowledgement of country

The proposal is on the land of the Darug people. We acknowledge these traditional custodians and their ancestors of the land and waters. Their lore, traditions and customs nurture and continue to nurture the water, creating wellbeing for all. We also pay our respect to Elders, past and present.

Determination

This Review of Environmental Factors (REF) assesses the potential environmental impacts of the Prospect Pre-treatment Plant Augmentation and Upgrade program (Package 1). The REF was prepared under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with Sydney Water both the proponent and determining authority.

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

Decision Statement

The main potential construction environmental impacts of the proposal include erosion and sedimentation, vegetation removal, impacts to non-Aboriginal heritage, noise and visual amenity changes. During operation, the main potential impacts are associated with visual amenity, discharge to waters and waste generation. The main benefits are providing a resilient and reliable water supply for Greater Sydney.

The proposal will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats. Therefore, a Species Impact Statement (SIS) and/or Biodiversity Development Assessment Report (BDAR) is not required.

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

Certification

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

Prepared by:	Reviewed by:	Endorsed by:	Approved by:
[redacted]			
Samantha Prior REF author Sydney Water Date: 7/2/2025	Sally Spedding Environmental Assessment Team Manager Sydney Water Date:10/2/2025	Jesse Mulholland Project Manager Sydney Water Date: 10/2/2025	Murray Johnson Senior Manager, Environment and Heritage Sydney Water Date: 20/02/2025

1 Executive summary

Prospect Water Filtration Plant (Prospect WFP) is the main source of drinking water for the Prospect Water System which supplies more than 80% of Greater Sydney's water. During poor raw water quality events the Prospect WFPs capacity is reduced. To improve the reliability and resilience of the Prospect Water System, Sydney Water proposes to construct a new pre-treatment plant and complete improvement works at Prospect WFP.

The Prospect Pre-treatment Plant (PPTP) will pre-treat raw water from Warragamba Dam to remove turbidity and colour. This pre-treated raw water will then be discharged back into the existing open channel that supplies raw water to Prospect WFP before blending with other raw water sources from the Upper Canal and Prospect Reservoir.

The proposal addresses the following key problems:

- Increased risk of flooding at Prospect WFP due to changes to the 2011 Australian Drinking Water Guidelines (ADWG).
- Increased frequency of poor raw water quality has decreased Prospect WFPs ability to meet current and future demand.
- Increased frequency of poor raw water quality limits Prospect WFPs ability to produce drinking water.

This REF assesses the potential impacts of the proposal on the surrounding environment. Our assessment concludes that the proposal is unlikely to have a significant adverse impact on the environment and an EIS is not required. The main potential construction environmental impacts of the proposal include erosion and sedimentation, vegetation removal, impacts to non-Aboriginal heritage, noise and visual amenity changes. During operation, the main potential impacts are associated with visual amenity, discharge to waters and waste generation.

The main benefits are providing a more resilient and reliable water supply for Greater Sydney.

2 Introduction

2.1 Context

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

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

2.2 Proposal background and need

Prospect Water Filtration Plant (WFP) is the main source of drinking water for the Prospect Water System which supplies more than 80% of Greater Sydney's water. Prospect WFP is currently operated and maintained by Prospect Water Partnership (PWP). Prospect WFP is under increasing risk of non-compliance with the ADWG standards due to more frequent poor raw water quality.

Sydney Water propose to construct and operate the PPTP upstream of Prospect WFP to improve the reliability and resilience of the Prospect Water System. The PPTP will pre-treat raw water from Warragamba Dam to remove turbidity and colour before blending it with other sources and supplying it to Prospect WFP.

The proposal will address the following key problems:

Increased risk of flooding at Prospect WFP due to changes to the ADWG

When filters at Prospect WFP exceed turbidity limits they are taken offline and backwashed. After backwashing there is a filter ripening period where turbidity is elevated before working properly again. While filters are offline, the plant has limited ability to reduce or divert the incoming raw water supply to the filters, increasing the risk of flooding. This could shut down the plant for weeks or months, affecting Sydney Water's ability to provide safe and reliable water.

This creates a non-compliance risk with the ADWG, Sydney Water's Operating Licence and specifications agreed with NSW Health.

Increased frequency of poor raw water quality has decreased Prospect WFP's ability to meet current and future demand

Greater Sydney's population will grow significantly over the next 20 years. Average daily drinking water demand in the Prospect Water System is expected to rise by 30% (to 1,500 ML/day) and

maximum daily demand by 40% (to 2,210 ML/day). The system must be able to service this future demand.

The Prospect WFP has a maximum capacity of 3,000 ML/day, but this depends on raw water quality. If the water quality is poor, the capacity drops to 1,500 ML/day. Extended periods where Prospect WFP needs to produce drinking water beyond its warranted capacity will become more common.

Increased frequency of poor raw water quality limits Prospect WFPs ability to produce drinking water

The Prospect WFP was designed to treat a specific raw water quality, removing colour, turbidity, and high iron and manganese levels. When raw water quality is poor, PWP operates Prospect WFP under 'best endeavours' and works with Sydney Water to maximise output using water from Upper Canal and Prospect Reservoir.

Although recent efforts have managed the supply, growing demand will make this harder over time. Current strategies aren't sustainable long-term. Poor raw water quality reduces Prospect WFPs ability to meet the ADWG and customer demand.

The PPTP Augmentation and Upgrade program is divided into three packages:

- Package 1: Construction and operation of the new 500 ML/day PPTP (this REF).
- Package 2: Flood works, including a new tilting gate emergency release point to Prospect Reservoir and decommissioning old assets.
- Package 3: Upgrades to the Prospect WFP including solids and residuals handling and new backwash recovery pumps.

Package 2 and 3 will be delivered by PWP and will be subject to separate environmental impact assessment covered by subsequent REFs.

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 Prospect WFP is the main source of drinking water for the Prospect Water System, which supplies more than 80% of Greater Sydney's water. However, the sensitivity of the treatment process and the deterioration of the raw water supply (from extreme weather events) has resulted in reduced treatment capacity and production at Prospect WFP. It is predicted that Greater Sydney's population will grow by 23% to 6.1m by 2041 increasing the demand for drinking water. As demand increases, so too does the need for upgrades to Prospect WFP to ensure the supply of safe drinking water.

Aspect	Relevance to proposal
	A new pre-treatment plant and upgrades to the Prospect WFP are required to ensure we can meet the current and future drinking water demand of our customers.
Proposal objectives	The proposal objectives are to: **Provide a more resilient and reliable water supply** • Improve the reliability and resilience of the Prospect Water System to ensure: - a secure water supply is provided to customers to meet current and future demand - safe drinking water is supplied to customers that is compliant with Sydney Water's Operating Licence and ADWG - the protection of public health. **Improve sustainability and minimise community impact** • Reduce the risk of failure and loss of production at Prospect WFP to acceptable levels to ensure the continuity of drinking water supply. • Mitigate any negative impacts to sustainability, the environment and key stakeholders. **Be adaptable to change** • Ensure investments are adaptable to meet future changes in ADWG and raw water quality. **Improve cost effectiveness** • Achieve a value for money outcome that minimises whole of life costs to key stakeholders.
Consideration of alternatives/options	A total of 13 long-listed options were considered against a do-minimum scenario. A quantitative Multi Criteria Analysis (MCA) workshop was held with key internal stakeholders to assess each option against the proposal objectives and the following criteria: • Criteria 1: Reliable and resilient water supply • Criteria 2: Delivery and technical complexity • Criteria 3: Resilience and adaptability • Criteria 4: Commercial and interface impacts, including capital costs, risks and delivery timeframe • Criteria 5: Sustainability and environmental impacts • Criteria 6: Social and stakeholder impacts.

Aspect	Relevance to proposal
	Based on the assessment undertaken, the short-listed options included: • Option 1 – Upgrade of Prospect WFP • Option 2 – New pre-treatment plant and Prospect WFP improvement works. Further analysis revealed Option 1 was not commercially viable and did not address the full suite of potential benefits or flood risk requirements. Two sub options were subsequently identified for Option 2. A summary of the final short-listed options is provided below. **Base Case - Do-Minimum** • No capital works upgrades to the existing Prospect WFP or new infrastructure created to treat poor raw water quality. • Inclusion of: - an operating cost allowance for chemical dosing to treat manganese in the source water for the operating life of Prospect WFP. - variable operating costs to Sydney Water by PWP when source water is outside the warranted capacity under best endeavour plant operations. **Option 2a - New 750 ML/day pre-treatment plant** • Package 1: New pre-treatment plant - Design and construct a new pre-treatment plant to pre-treat raw water from Warragamba Dam and blend with other raw water prior to treatment at Prospect WFP. Comprises a 750 ML/day ballasted flocculation process plant, residual handling and out-loading facilities, chemical storage and dosing system, ancillary works (high and low voltage electrical work, SCADA, site services, administration building). • Package 2: Flood mitigation works - Install a new tilting gate/bulkhead at Channel 7 to divert raw water to Prospect Reservoir. - Decommission PWP raw water pumping station. • Package 3: Prospect WFP upgrade works - Upgrade the backwash recovery pumps and solids handling system at Prospect WFP. **Option 2b – New 500 ML/day pre-treatment plant** • As per Option 2a, except that the plant is sized at 500 ML/day rather than 750 ML/day.

Aspect	Relevance to proposal
	Each short-listed option was subjected to a cost benefit analysis (CBA), MCA, financial appraisal and risk assessment. To capture the whole of life costs and implications, analysis of options was conducted on Packages 1, 2 and 3 combined. Option 2b was selected as the preferred option as it: • requires less footprint and can be constructed on one side of Channel 1 compared with Option 2a and does not require additional 3rd party land access. • allows for greater reliance on climate independent sources through Sydney Desalination Plant (SDP) expansion compared with Option 2a. • reduces the need for overinvestment and allows for alternative options to be adopted in the future that will be less reliant on Warragamba raw water if the incoming water to the plant deteriorates in the future.

2.3 Consideration of Ecologically Sustainable Development

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

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

Principle	Proposal alignment
Precautionary principle - *if there are threats of serious or irreversible environmental damage, lack of scientific uncertainty should not be a reason for postponing measures to prevent environmental degradation. Public and private decisions should be guided by careful evaluation to avoid serious or irreversible damage to the environment where practicable, and an assessment of the risk-weighted consequences of various options.*	The proposal will not result in serious or irreversible environmental damage and mitigation measures have been designed to reduce any scientific uncertainty. This principle was considered throughout the options assessment and reference design process of the proposal. Multi-criteria analysis and risk assessments have been completed to ensure serious and adverse damage to the environment is avoided.
Inter-generational equity - *the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*	The proposal will help to meet the needs of future generations by providing a more reliable water service. This proposal provides the infrastructure needed to ensure the supply of safe drinking water for the Prospect Water System.The proposal's resilience to future changes in climate has been assessed, with specific adaptation measures incorporated into the design and operation (see Section 6.2.11).

Principle	Proposal alignment
	The proposal involves some activities that may result in social and environmental disturbance. However, these would be managed in accordance with the mitigation measures in this REF to minimise impacts.
Conservation of biological diversity and ecological integrity - *conservation of the biological diversity and ecological integrity should be a fundamental consideration in environmental planning and decision-making processes.*	The proposal will not significantly impact biological diversity or ecological integrity. The proposal was designed to avoid and minimise impacts to sensitive ecological features as much as possible. This includes avoiding impacts to threatened vegetation along the reservoir edge and establishing no-go zones to reduce impacts to vegetation. Additionally, implementing non-statutory biodiversity offsets will improve the biological diversity and ecological integrity of the area.
Improved valuation, pricing and incentive mechanisms - *environmental factors should be included in the valuation of assets and services, such as 'polluter pays', the users of goods and services should pay prices based on the full life cycle costs (including use of natural resources and ultimate disposal of waste) and environmental goals*	The proposal will provide cost efficient use of resources and provide optimum outcomes for the community and environment. All options were subject to a lifecycle cost analysis.

3 Proposal description

3.1 Proposal details

3.1.1 Proposal description

Sydney Water proposes to build and operate the PPTP adjacent to Prospect Reservoir and about 1.2 km upstream of the Prospect WFP. The PPTP will have a treatment capacity of 500 ML/day. The PPTP will pre-treat raw water from Warragamba Dam to remove turbidity and colour before blending it with other sources and supplying it to Prospect WFP for further treatment.

The scope of works includes the following key elements:

- Raw water inlet channel and screenings system to transfer raw water from Channel 1.
- Raw water pump station (RWPS) to pump screened raw water to the PPTP.
- Water treatment system to remove colour and turbidity from the screened raw water using chemically ballasted sedimentation tanks (CBST).
- Outlet pipes into Channel 1 (to send pre-treated water to the Prospect WFP) and into Channel 7 (to send off-spec pre-treated water to Prospect Reservoir).
- Chemical storage and handling systems for dosing chemicals (ferric chloride, polymers, lime).
- Sludge treatment system to thicken, dewater and store settled solids from the treatment process for off-site disposal.
- Stormwater treatment system including gross pollutant traps and bioretention basins to treat site runoff before discharging to Prospect Reservoir.
- Administration building with control room, office, lab, workshop, storage area and parking for operational and maintenance staff.
- SCADA control system for automatic operation and integration with other assets and IICATS.
- Site services including access roads, power (low-voltage and high-voltage), water, wastewater, compressed air, telecommunications, firefighting, fencing, gates and security systems.
- Removal, demolition and restoration of existing redundant buildings, chemical tanks, fencing, and road pavement.

Figure 3-1 shows the indicative layout of the plant including all key elements. Figures 3-2 and 3-3 show the indicative site drainage and new outlets to Prospect Reservoir. The major structures required are summarised in Table 3-1.

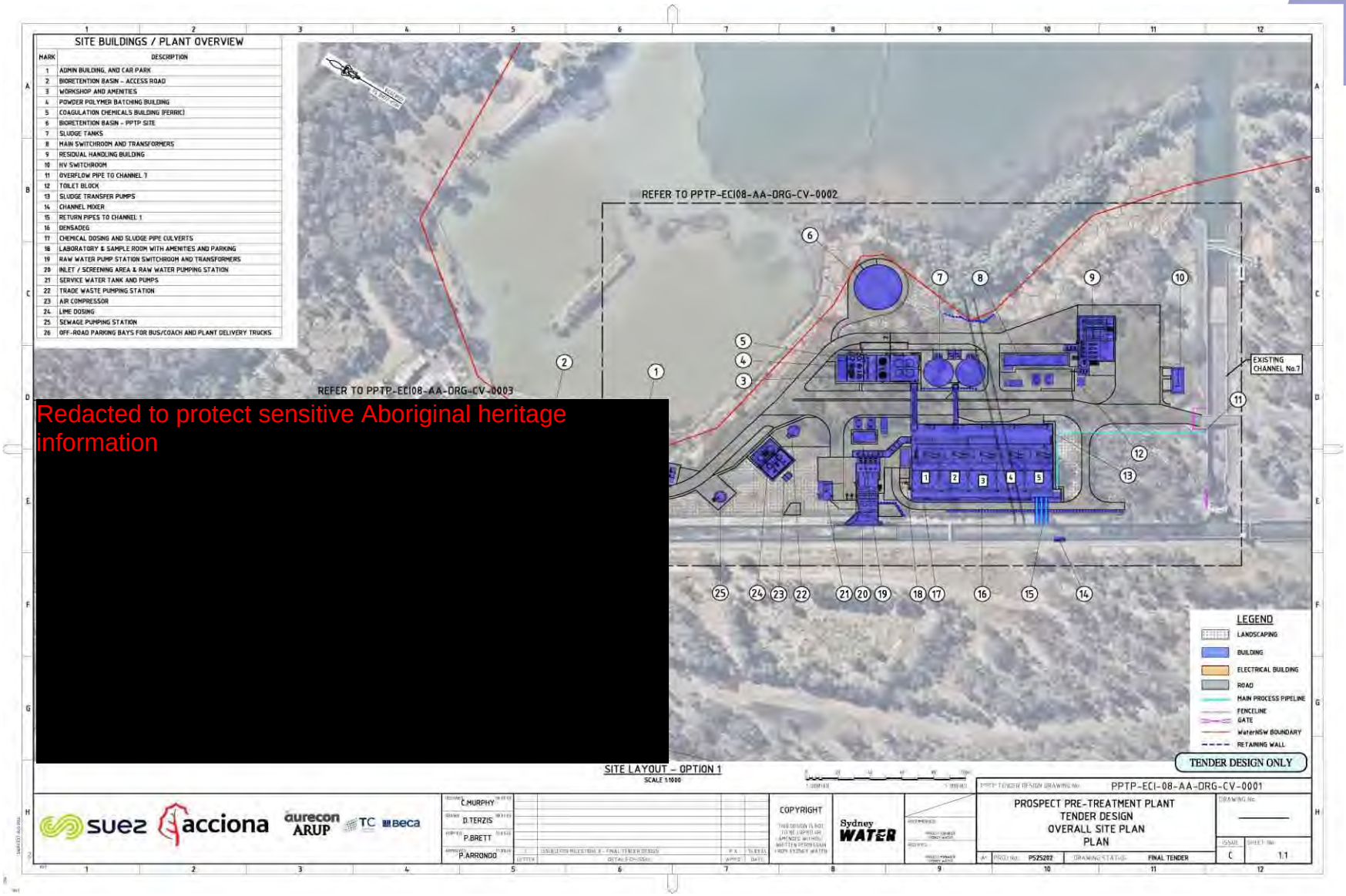

Figure 3-1 Proposed arrangement of the PPTP

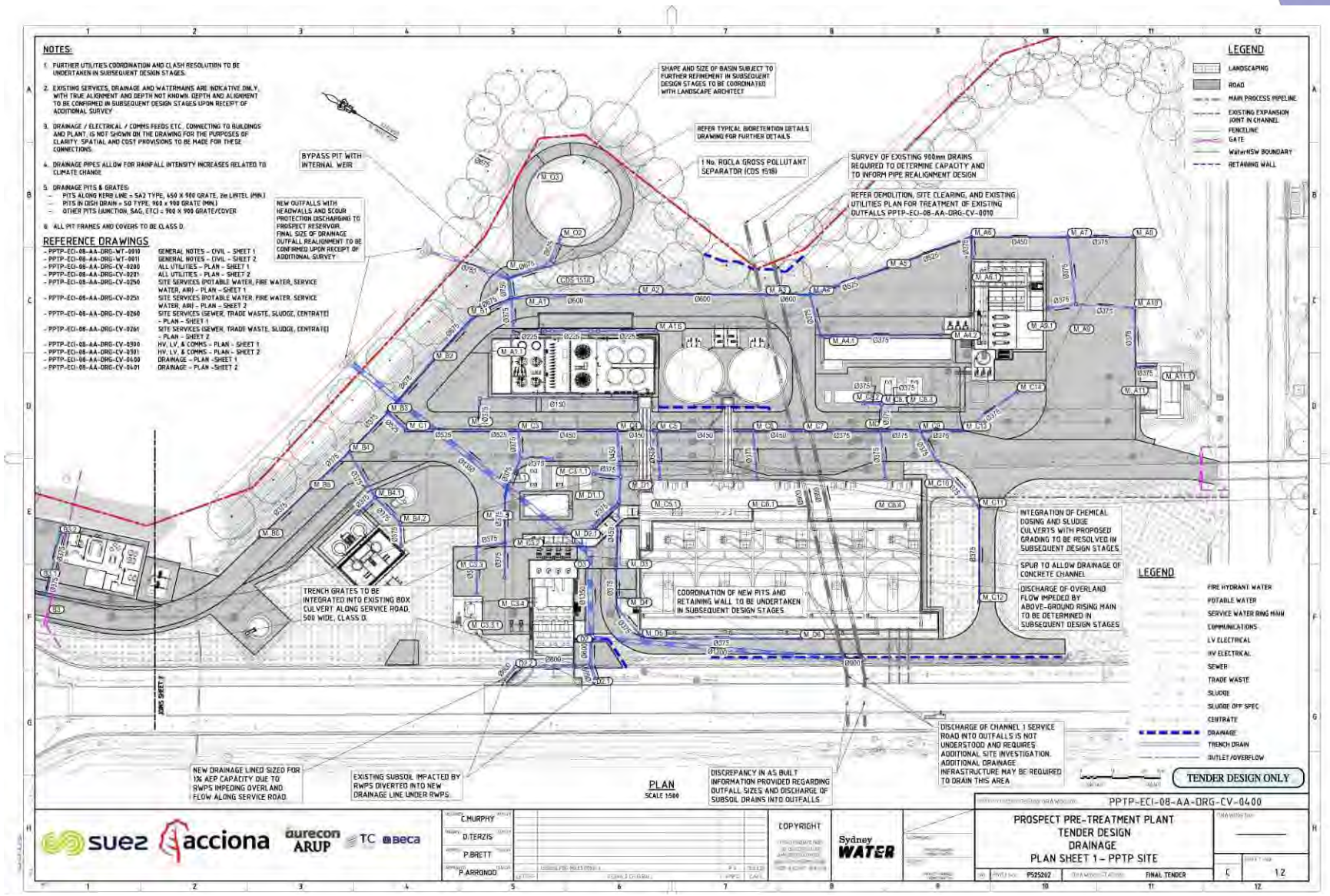

Figure 3-2 Proposed site drainage plan (1 of 2)

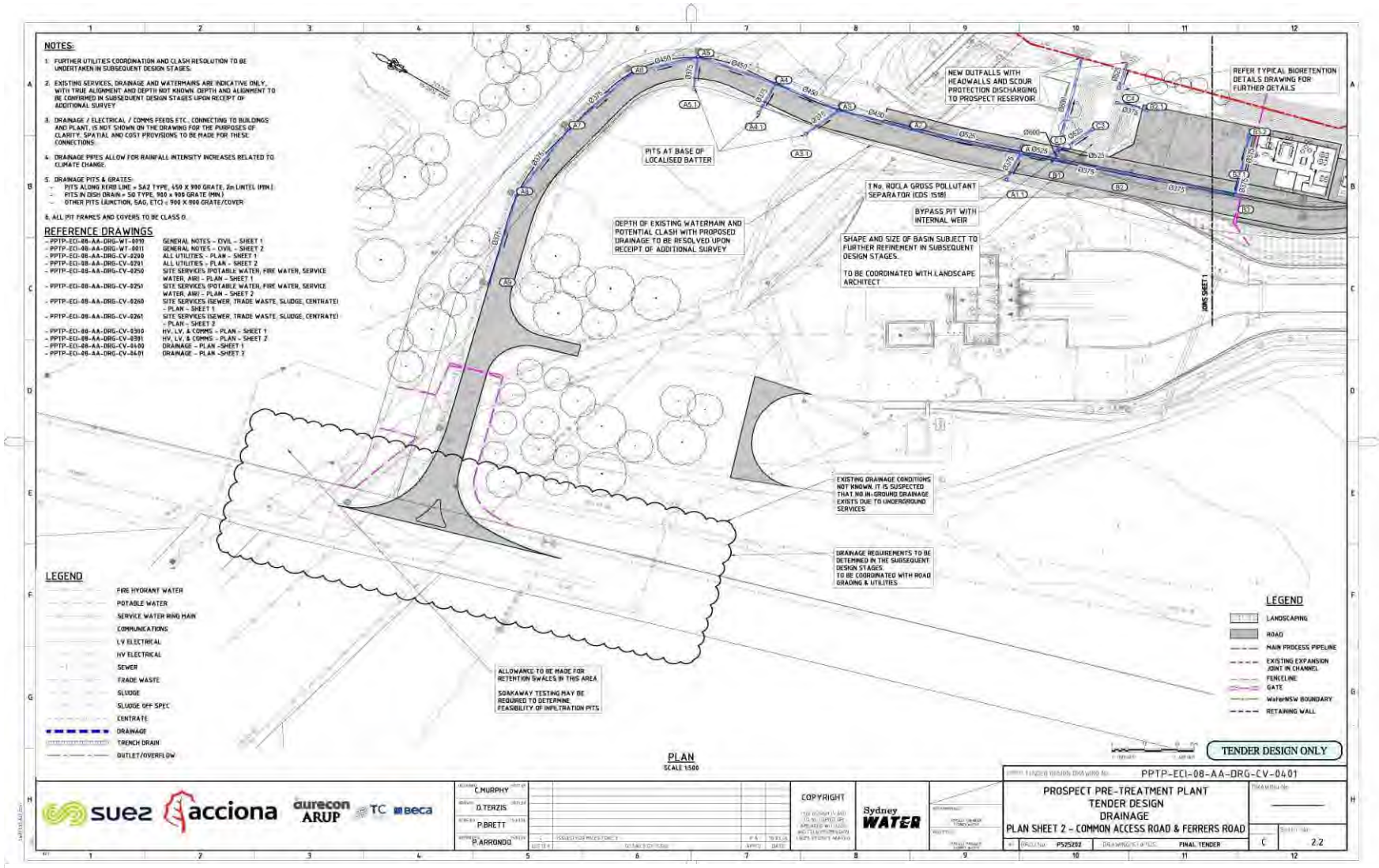

Figure 3-3 Proposed site drainage plan (2 of 2)

Table 3-1 PPTP major structures

Structure	Description	Figure 3-1 reference
Administration building	The administration building is one storey with a footprint of about 24 m x 16 m. It will house the kitchen, meeting rooms, office space, communications room, SCADA room, services room and amenities.	1
Chemical dosing building	The chemical dosing building has a footprint of about 18 m x 51 m. It will be used to store, batch and dose the ferric chloride and polymers needed for pre-treatment. The building will house: • a workshop and storage area • tanker unloading area and panel • dedicated ferric chloride and PolyDADMAC storage tanks • flocculant polymer storage silos, dosing and batch tanks • dosing pumps and skids • piping to dosing points within the PPTP.	3,4 and 5
Lime dosing building	The lime dosing building has a footprint of about 19 m x 12 m. It will house screw conveyors, lime slurry preparation tanks and pumps to feed lime slurry for pre-treatment. Two hydrated lime silos will be installed adjacent to the building (5 m wide x 16 m tall).	24
Sludge storage tanks	The two sludge storage tanks will be about 18 m wide and 18 m high. They will store excess sludge from the CBSTs prior to dewatering and will have a combined storage volume of 8,000m^3.	7
Residuals handling building	The residuals handing building houses the sludge dewatering and out loading system. The building is three storeys high with a footprint of about 39 m x 33 m. The ground floor contains the: • powder polymer unloading area • polymer silos and transfer pumps • polymer batching and dosing tanks and pumps • centrate tank and pumps • off-spec cake tank and pumps • sludge cake out loading bays. The mezzanine floor contains the sludge cake screw conveyors, electrical switch room and access walkways. The upper floor houses the centrifuges and conveyors.	9

Structure	Description	Figure 3-1 reference
Inlet works and raw water pump station	The inlet works and RWPS will connect into Channel 1 with an opening about 24 m wide and 5 m deep. The RWPS will be buried 4-5 m below ground level. The structure will contain: • a raw water channel • isolation stopboards • screening and service water system • submersible raw water pumps • associated pipework • access platforms and stairs.	20
CBSTs (Densadeg)	The overall footprint of the Densadeg is about 93 m x 40 m. The structure is partially buried with a total height of 8.4 m. The structure will include an inlet pipe and distribution chamber and five CBSTs units with common outlet to send pre-treated water back to Channel 1. Each CBST unit will contain: • an inlet channel • chemical dosing lines • coagulation and flocculation chambers with mixer • settling tank with sludge hopper, scraper and lamella tubes • sludge pumps and associated pipework • penstocks and stopboards • outlet chamber with void to common out of spec chamber with bypass to Channel 7.	16
Switch rooms	Multiple electrical switch rooms are required to supply the various process units. The switchrooms will house electrical equipment including circuit breaker racks, HV switchgear, remote operating panels, distribution boards, battery and battery chargers.	8, 10 and19
Pipelines	Various above and below ground pipework in a variety of sizes is required across the site. Large diameter pipework includes: • 175 m of DN12100 for the Channel 7 bypass • 120 m of DN1800 for the Densadeg to Channel 1 outlet • 50 m of DN2000 between the RWPS and manifold.	NA

3.1.2 Water treatment process

The water system includes all process steps from the inlet works through to discharge of water back into Channel 1.

Raw water screening and washing

Raw water from Channel 1 flows into the inlet works where it passes through three band screens to remove debris. Screenings will be dewatered and collected in storage bins. The excess water will drain back into the inlet channel upstream of the screens. Screened raw water is also used for washdown and chemical dilution in the PPTP.

Raw water pump station

Screened raw water is collected in the screening outlet chamber, where it is pumped by the RWPS to the next stage of treatment via a rising main. Lime can be dosed at this point to optimise pH and alkalinity.

Chemically ballasted sedimentation tanks

Water flows from the inlet chamber into the five CBSTs where it is mixed with coagulants (ferric chloride and PolyDADMAC) to help remove solids. Coagulated water is then mixed with flocculant polymer and recirculated sludge to form larger floc. Chemically ballasted floc settles to the bottom of the CBSTs and thickens into sludge. Clarified water is collected, monitored and sent back to Channel 1 for further treatment at the Prospect WFP. Off-spec water is diverted to Prospect Reservoir via Channel 7.

The flow of water and sludge through the CBST process is shown in Figure 3-4.

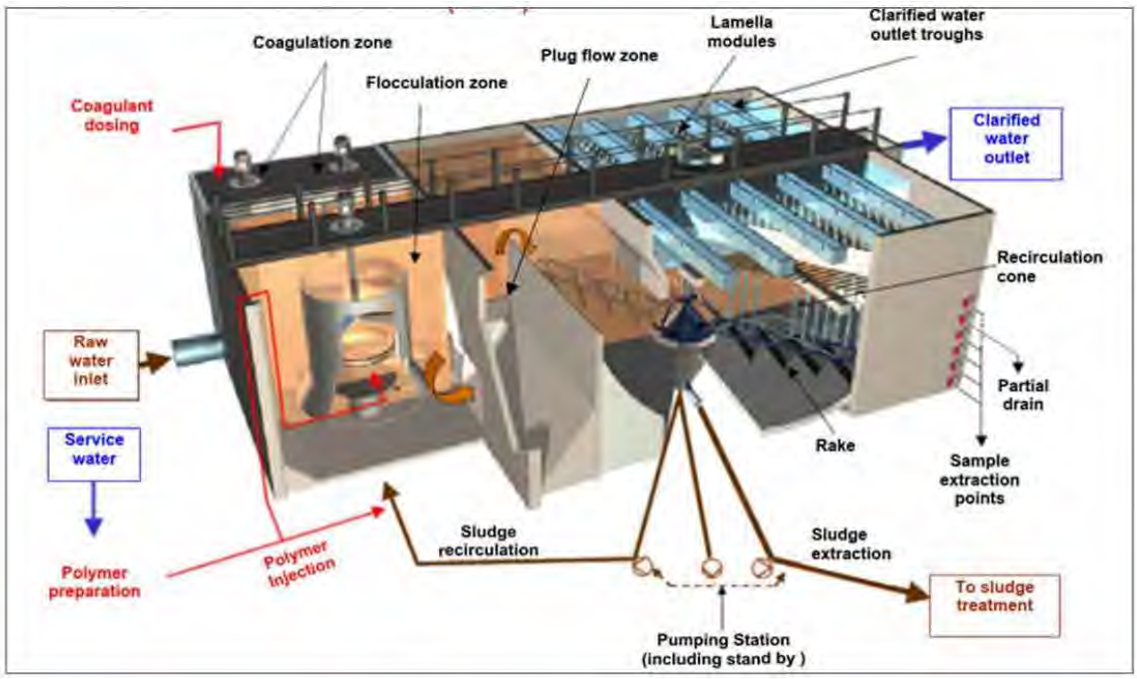

Figure 3-4 Densadeg CBST process

3.1.3 Sludge treatment process

The sludge system includes all process steps from sludge extraction from the CBST through to sludge out loading.

Sludge storage

Sludge from the CBST will be pumped to two sludge storage tanks. A portion of the sludge is continuously recirculated back into the flocculation chamber, where it is dosed with more flocculant polymer to help form floc. Each tank has a pumped mixing system to keep the solids in suspension until dewatering.

Sludge dewatering

Sludge from the sludge storage tanks will be dewatered to reduce its volume. Flocculant polymer and a dewatering centrifuge will be used to separate the solids from liquid. The remaining liquid (centrate) will be pumped back to the CBST inlet works, with the remaining dewatered sludge (cake) transferred to the out-loading. Off-spec cake is collected and sent back to the sludge storage tanks for retreatment.

Sludge cake handling and out loading

Cake will be conveyed to the out-loading facility and loaded directly into truck trailers for offsite disposal. The weight and level of cake in the trailers will be monitored. When one trailer is full, the system loads the next available trailer. Five days storage can be achieved when out loading is unavailable.

Supporting processes

There are multiple chemical dosing systems and plant-wide services like service water, compressed air, fire water, trade waste and wastewater systems that support the treatment process.

Chemicals that will be stored and used at the PPTP include lime, ferric chloride, PolyDADMAC, flocculant polymer, and dewatering polymer. Each chemical required for dosing requires a storage tank and dosing pump. All chemical storage facilities will meet the relevant codes for safe storage and handling.

3.1.4 Location and land ownership

The majority of the PPTP will be located on Sydney Water land (Lot 304 DP1122291) with some drainage infrastructure on WaterNSW land (Prospect Reservoir Lot 1 DP1062094) within the Blacktown and Fairfield Local Government Areas (LGAs). Access road upgrades will also occur within the council owned road corridor outside Gate 10.

Figure 3-5 shows the PPTP location and land ownership.

3.1.5 Site establishment and access tracks

Site establishment will involve:

- marking out and establishing designated areas of the proposal such as the construction area, compounds and stockpiles
- installing construction signage and temporary fencing
- installing concrete barriers to protect critical assets from vehicle damage
- establishing no go zones
- establishing erosion and sediment controls
- grubbing site, stripping and stockpiling topsoil for reuse during restoration
- demolishing disused structures within the project footprint
- delivering and storing materials and equipment.

The site can be accessed via the local road network with entry points at Gate 10 along Ferrers Road, Horsley Park and Gate 8 along Cowpasture Road, Wetherill Park. The existing Sydney Water internal road network will be used and no new access tracks are required. Some realignment of internal access roads will occur.

3.1.6 Ancillary facilities

The main site compound will be established near Gate 10 and will include:

- meeting rooms with video conference facilities
- induction and first aid room
- kitchens and lunchrooms
- change rooms
- open covered hardstand area
- ablution and septic facilities
- storage area for construction materials and equipment
- 250 parking spaces for staff and visitors
- drinking water connection to an existing DN100 water service entering the PPTP site
- generator power supply (required prior to mains connection)
- power supply from existing 11kV overhead power lines originating from Prospect ZS East and feeding the Prospect Pilot Plant.

A second compound will be established adjacent to Channel 7, within the PPTP site and will include:

- semi-portable ablution block
- mobile office

- parking
- generator power.

Multiple laydown and storage areas will also be required for subcontractor use, including for tools, consumables and construction materials.

The exact location of these compounds, laydown and storage areas will be chosen by the contractor and remain within the study area, in consultation with the landowner(s) and approved by Sydney Water's Project Manager as described in the mitigation measures in Section 6.

3.1.7 Construction phases

The construction of the PPTP involves six main phases, which may overlap. These phases will be developed further during detailed design and construction planning. A detailed construction methodology is provided in SAJVs Construction Methodology and Management Plan (SAJV, 2024). Table 3-2 summarises the construction phases including typical construction activities.

Table 3-2 PPTP construction phases and typical activities

Phase	Typical construction activities
1 – Early works	• site/geotechnical investigations • environmental investigations • remove surface vegetation • demolish existing structures • topsoil stripping.
2	• site establishment • gate 10 relocation • bulk earthworks for Densadeg and inlet works • construct perimeter road • install transverse drainage.
3	• construct inlet/RWPS • construct Densadeg • construct administration building • construct permanent internal roads and utility connections.
4	• construct coagulation chemicals building • construct residuals building • install sludge tanks

Phase	Typical construction activities
	• construct HV/LV switch rooms • construct Channel 1 connection.
5	• construct large diameter pipelines • construct Channel 7 connection • mechanical and electrical fit out • backfill large excavations • construct other ancillary buildings • install site utilities.
6	• undertake dry and wet commissioning of all plant and equipment • install pavements, kerb and gutter • finishing works including kerb and gutter, pavements, concrete hardstands, delivery bunds, road furniture and signage • site demobilisation • landscape and site remediation.

3.1.8 Construction materials

Typical materials required for construction will include:

- sand
- stabilised sand
- gravel
- clay
- spoil (backfilling)
- concrete
- steel (both pipe and reinforced concrete)
- structural steel and cladding
- carpet
- paint
- gyprock
- timber framing
- structural aluminium and cladding
- insulation building materials
- waterproofing membranes
- polyurethane coatings
- sarking
- compressed fibre cement sheeting
- bitumen/asphalt
- Polyethylene (PE) pipe
- Poly Vinyl Chloride (PVC) pipe.
- copper pipe
- PE liner for basins

- fibre glass
- plastic (pipe and civil construction)
- geo textile
- glass (buildings)
- timber (formwork)
- paint for corrosions protection (chemical bunds and buildings)
- mech install will depend on equipment selected
- brick and block
- cementitious mortar
- epoxy mortar
- epoxy coating and lining material
- solvent cements, glue, epoxy, polyester resin
- mastics, sealants
- nuts, bolts, screws, fastening hardware, nails
- rubber sheeting, isolators, gaskets.

3.1.9 Construction equipment

Typical plant and equipment required for construction will include:

- air compressors
- backhoe
- barges
- bobcats
- chainsaws
- compacting equipment (e.g. rollers)
- concrete cutting/sawing
- concrete pumps and trucks
- concrete vibrators
- cranes
- delivery trucks
- dozers
- dredger
- dump truck
- excavator
- front end loaders
- generators
- grader
- hand tools
- jack hammers
- manitou trucks
- piling rig
- power tools (various)
- pumps
- roller
- small compactors
- truck and dog trucks
- vehicles (utes, 4x4, 2T up to 10T trucks)
- water carts
- welding equipment
- woodchippers.

3.1.10 Construction work force

The number of construction staff on site will depend on the schedule of works and construction program. During peak construction there will be about 200 staff on site.

3.1.11 Work hours

Where reasonable and feasible, construction work and deliveries will occur during standard daytime hours:

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

No work would take place on Sundays and public holidays.

Out of hours works will be required for certain activities including:

- the delivery of oversized plant, equipment and materials that police or other authorities determine require special arrangements to transport along public roads
- where a road occupancy licence is required for an activity likely to impact on traffic flow, such as road maintenance work or lane closures around a building site
- works that cannot be completed within the standard respite periods for engineering reasons. This includes the connection and cut-in to existing assets such as Channel 1 and 7.

For this project, extended working hours on Saturdays are proposed from 8 am to 5 pm to enable a full day of work on Saturday. This is to assist in reducing the overall construction period. Out of hours work is considered further in Section 6.2.6.

3.1.12 Proposal timing

Construction of the proposal is expected to commence in March 2025 and is estimated to be completed by February 2027. The PPTP is expected to be commissioned and operational by August 2027.

3.1.13 Commissioning

Commissioning follows the completion of construction and involves testing and running new equipment to confirm it meets the expected performance criteria. The exact commissioning steps will depend on the type of equipment and system configuration, but typically include:

- provide site labelling
- factory acceptance testing
- construction verification
- electrical energisation
- dry testing of equipment

- wet commissioning with drinking water
- process commissioning with chemical dosing and water quality sampling
- operator training and preparation of maintenance manuals.

3.1.14 Restoration

Post construction restoration activities will include:

- decommissioning any redundant assets
- dismantling the site, cleaning up and restoring areas
- reinstating damaged roadways and ground surfaces
- removing waste materials, machinery and excess materials
- replanting trees and restoring grassed areas
- removing environmental controls, temporary fencing, site sheds, amenities and safety barriers
- fixing any defects during the liability period.

3.1.15 Operational requirements

The PPTP will be operational for 24 hours a day, seven days a week.

During periods of stable, good quality raw water, the PPTP may be placed into hot standby mode. The PPTP must start up from hot standby to normal capacity and achieve compliance with the pre-treated raw water performance requirements within one day.

During extended periods where pre-treatment is not required, the PPTP can be placed into a mothballed state until needed (both the entire plant and sections of the plant).

The operation of the PPTP would require an estimated peak work force of about 15 staff during extreme poor raw water conditions. During a normal operational day, about five staff are expected.

Raw water design envelope

The PPTP will be supplied with raw water from Warragamba Dam via Channel 1, but may also treat raw water from Prospect Reservoir in the future. The raw water design envelope and the normal design range for the PPTP was developed based on the worst case current and future water quality from these sources and is shown in Table 3-3.

Table 3-3 PPTP raw water design envelope

Parameter	Unit	Design Envelope	Normal Design Range
Algae (total cell count)	cells/mL	0–750,000	0–200,000
Algae	ASU/mL	0–3,500	0–1,500

Parameter	Unit	Design Envelope	Normal Design Range
Alkalinity	mg/L as $CaCO_3$	22–90	24–65
Dissolved organic carbon	mg/L	0–15	0–9
pH		5.9–9.1	6.4–8
Temperature	°C	10–28	10–22
True $colour_{420nm}$ [1]	HU	0–103	0–80
Turbidity	NTU	0–268 [2]	20–35
Total chlorine [3]	mg/L	0–0.25	00.16

[1]True colour measured based on a 0.45-micron Sartorius filter at a 420-nanometre wavelength.

[2]Turbidity greater than 85 NTU is unlikely to occur for more than 1 day.

[3]Total chlorine due to raw water chlorination at Warragamba WT016.

Performance requirements

The PPTP has been designed to treat 500 ML/day with a surge capacity of 750 ML/day. The PPTP will require a minimum flow of 125 ML/day to operate.

Pre-treated water performance

When raw water supply is within the normal design range (see Table 3-3) the PPTP must produce pre-treated water that meets the performance criteria listed in Table 3-4.

Table 3-4 Pre-treated raw water performance criteria

Parameter	Unit	Performance criteria
Turbidity	NTU	Median < 2 NTU and 95th percentile < 6 NTU
True $Colour_{420nm}$ [1]	HU	Median < 10 HU and 95th percentile < 20 HU
pH	-	Within +/- 0.5 pH units from nominated setpoint within the range of 6.5 – 8.0
Alkalinity	mg/L as $CaCO_3$	Within +/- 5 mg/L from nominated setpoint within the range of 21 to 45 mg/L

[1] True Colour measured based on a 0.45-micron Sartorius filter at a 420-nanometre wavelength.

Sludge performance

Thickened sludge generated from raw water within the normal design range must not be greater than 2.5% w/w dry solids (i.e. 2.5 g dry solids in 100 g thickened sludge). The sludge thickening process must achieve supernatant with a turbidity of less than 35 NTU.

Dewatered solids generated from raw water within the normal design range must achieve a solids concentration of greater than 33% w/w dry solids (i.e. 33 g dry solids in 100 g dewatered solids). Filtrate from the sludge dewatering process must achieve a turbidity of less than 200 NTU.

Operational discharges

Operation of the PPTP will result in discharges to Prospect Reservoir under certain scenarios. A summary of these discharges is provided in Section 6.2.2.

A discharge protocol will be developed and agreed with WaterNSW in accordance with the Raw Water Supply Protocols – Operational Protocol (RWSP) (2016), to manage the notification and reporting of discharges including volume, duration and water quality parameters to Prospect Reservoir.

As these discharges will contain residual water treatment chemicals an EPL for pollution of waters is required from the EPA prior to operation.

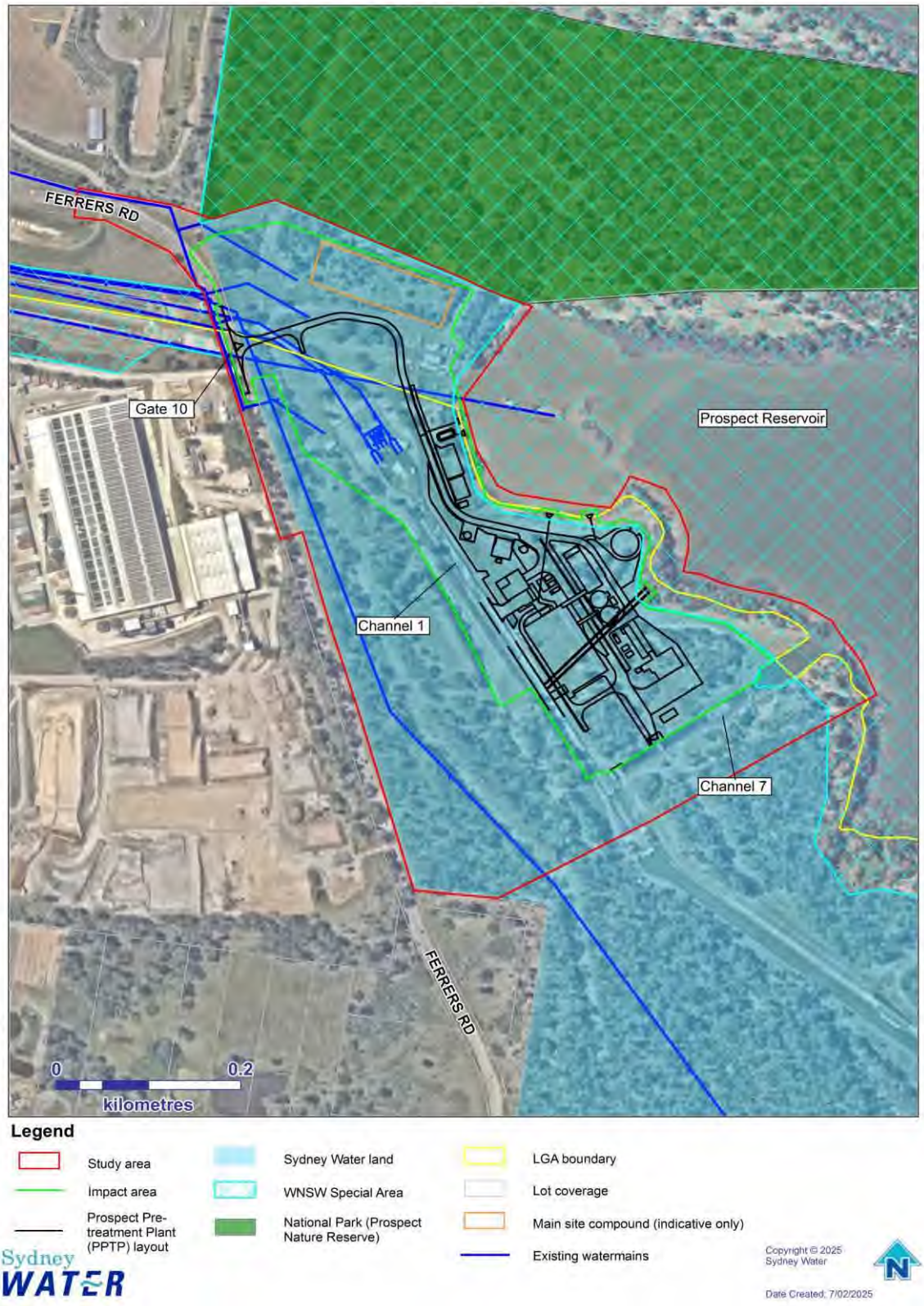

Figure 3-5 Site layout and land ownership

3.2 Field assessment area and changes to the scope of work

The study area is shown in red and the impact area is shown in green in Figure 3-5. The impact area includes both the PPTP site and land north of gate 10 that is intended to be used for temporary site facilities including construction laydown, storage, stockpiles, offices/lunchrooms and compounds.

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

4 Consultation

4.1 Community and stakeholder consultation - general

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

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

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

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

We will also provide local councils with reasonable notice when we 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 Community and stakeholder consultation - proposal

A Community and Stakeholder Engagement Plan (CSEP) has been developed for the proposal which ensures:

- community and stakeholders are provided with timely and relevant information about the proposal
- communication to and from stakeholders and the community is adequately documented
- community and stakeholders are provided with a responsive point of contact for any enquiries, complaints or suggestions
- internal and external stakeholders are identified and provided with consistent messages about the proposal
- minimal disruption to impacted stakeholders and the wider community
- Sydney Water communications procedures and protocols are followed.

The project team has been interfacing with key stakeholders to identify issues such as complex interfacing with other infrastructure projects, potential environmental impacts and constraints, commercial models and project funding. Key project stakeholders include:

- WaterNSW
- Prospect Water Partnership
- Blacktown City and Fairfield City council
- government agencies:
  - Department of Planning, Industry and Environment
  - Environmental Protection Authority
  - Department of Premier and Cabinet
  - NSW Health (including Western Sydney Local Health District)
  - Department of Primary Industries Fisheries
- members and ministers of parliament (Member for Prospect, Minister for Water, Property and Housing, Minister for Planning and Public Spaces, Minister for Energy and Environment)
- Western Sydney Parklands Trust.

The key stakeholders above were sent introductory project letters and offered meetings to inform them of the proposal and seek their feedback. In addition to this, separate consultation with WaterNSW was undertaken. Consultation with WaterNSW is integral to the proposal as it manages and operates Prospect Reservoir that supplies raw water to Prospect WFP. This consultation is in line with the RWSP agreed between Sydney Water and WaterNSW. This process also includes a review of this REF by WaterNSW.

Limited wider community consultation has taken place as the proposal is located on Sydney Water and WaterNSW owned land. There are few nearby sensitive receivers that have the potential to be impacted during construction or operation of the proposal as Prospect WFP adjoins an industrial zone.

Given the project's objective is to improve the resilience and reliability of drinking water during poor raw water quality events this project is of high strategic value. It will deliver major, new assets and provide safe drinking water. However, despite its strategic significance, construction of the project is considered low risk as the works will take place on Sydney Water land with no immediate residential properties nearby. The nearest landowner is Austral Bricks, on Ferrers Road, about 300m from the site.

4.3 Consultation required under State Environmental Planning Policies and other legislation

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

Consultation with councils is required under section 210(1)(f) of the TISEPP if the proposal involves excavation that is not minor or inconsequential of the surface of, or a footpath adjacent to, a council managed road. The proposal involves minor road works at the Gate 10 entry off Ferrers Road for safe access to the site which does not trigger this consultation. Sydney Water has shared the Traffic Impact Assessment (Appendix G) with Fairfield and Blacktown City Councils for their information. The delivery contractor will continue to liaise with both councils for any Road Occupancy Licences (ROLs) needed during construction.

Department of Primary Industry (DPI Fisheries) was notified under s199 of the *Fisheries Management Act 1994* during REF preparation, as the work involve reclamation or dredging in a waterway classified as Key Fish Habitat (KFH) (Prospect Reservoir). Advice was received on 27th June 2023 and no additional mitigation measures were required. DPI Fisheries advised that Prospect Reservoir sits at the top of the catchment and does not have any KFH streams draining into it. As such, they consider this to be a low risk project and did not have any additional mitigation measures to recommend for inclusion in the REF.

The proposal will not directly or indirectly impact on land administered under the *National Parks and Wildlife Act 1974.* However, the study area is 'adjacent to a national park, nature reserve or other area reserved under the *National Parks and Wildlife Act 1974*'. In accordance with TISEPP, Department of Planning and Environment (National Parks and Wildlife Service (NPWS)) has been consulted about the proposal as it is adjacent to Prospect Nature Reserve. Feedback from NPWS was received on the 26th of June 2023. NPWS raised no objections to the proposed development. They requested the Developments Adjacent to NPWS Lands Guidelines (DPIE, 2020) are considered for ancillary works directly adjacent to Prospect Nature Reserve to limit any possible impacts.

Sydney Water has consulted with the Western Parkland City Authority as the proposal has a capital investment value of over $30 million and is in the Western Parkland City operational area. Feedback from WPCA was received on the 2nd of June 2023. Overall, WPCA supports the proposal as it represents an investment to improve the reliability of water supply for employment and housing growth within the Western Parkland City. WPCA requested that appropriate assessment of the heritage and environmental conservation areas within the Western Sydney Parklands be carried out as part of the REF assessment.

Part of the proposal is on WaterNSW owned land. WaterNSW reviewed the draft REF in December 2024 and their feedback has been incorporated into this document. Key items raised by WaterNSW included:

- Impacts on WaterNSW operations during construction and operation of the proposal.

- More detail on the consultation and coordination process during construction to ensure WaterNSW can still undertake their own works, such as the Prospect Pumping Station Upgrade project.
- Impacts on water quality from the discharge of process water and stormwater into the reservoir.
- Potential for scouring from discharges and potential impacts on the reservoir.

These items have been addressed to the satisfaction of WaterNSW in Section 6 and a letter of endorsement from WaterNSW was received on the 31 January 2025.

Internal consultation was conducted with the Environmental Regulatory Team in Water, Environment and Infrastructure Performance regarding EPL requirements under the *Protection of the Environment Operations Act 1997*. As the proposal would result in discharges into Prospect Reservoir that contain residual water treatment chemicals, an EPL for pollution of waters is required prior to operation.

5 Legislative requirements

5.1 Strategic context

Alignment of the proposal objectives with the strategic outcomes of relevant legislation, strategies, plans and policies is summarised in Table 5-1.

Table 5-1 Alignment of proposal objectives with relevant policies, legislation and strategies

Legislation, strategy, plan, policy	Strategic outcomes	Project objective			
		Reliable & resilient water supply	Sustainable & minimises community impact	Adaptable to change	Cost effective
Sydney Water Act 1994	Provide water services efficiently while protecting environment and public health.	✓	✓	✓	✓
Sydney Water Corporate Strategy 2020-2030	The strategy focuses on delivering water and waterways that are world-class and a system which is resilient to shocks and disruptions.	✓	✓	✓	✓
Sydney Water Long Term Strategy - Water Sensitive Sydney 2040	The vision for the long-term strategy is focused on making Greater Sydney liveable, sustainable, and resilient, with water playing a vital role in achieving this vision.	✓	✓	✓	
Sydney Water Strategic Capital Investment Plan (SCIP)	The SCIP considers investment drivers covering the 25 years from 2020 to 2044, and evaluates investment options for the delivery of water, wastewater and some stormwater infrastructure.	✓	✓	✓	✓
Greater Sydney Water Strategy	Resilient water services and enhanced environmental performance.	✓	✓	✓	✓
Greater Cities Commission	This plan sets a 40-year vision and a 20-year plan to manage growth and change in Greater Sydney. The plan is intended to assist infrastructure	✓	✓	✓	

Legislation, strategy, plan, policy	Strategic outcomes	Project objective			
		Reliable & resilient water supply	Sustainable & minimises community impact	Adaptable to change	Cost effective
Greater Sydney Region Plan	agencies to plan and deliver for growth and change and to align their infrastructure plans to place-based outcomes.				
Infrastructure NSW State Infrastructure Strategy	Support the growth, productivity and liveability of metropolitan and regional communities by ensuring that water security, quality and wastewater services protect public health and the environment.	✓	✓	✓	✓
NSW Critical Infrastructure Resilience Strategy (2018)	The strategy promotes NSW critical infrastructure that can: withstand shock events to continue operating; be returned to service as soon as possible after any disruption; responds to long-term stresses and focuses on improving infrastructure, organisational and community resilience.	✓	✓	✓	
Net Zero Plan Stage 1: 2020-2030	The Net Zero Plan Stage 1: 2020–2030 is the basis for NSWs action on climate change and goal to reach net zero emissions by 2050.		✓		
Infrastructure Australia Infrastructure Priority List (2020)	'Water Supply and Resilience for Greater Sydney' is identified as a high priority initiative. The initiative aims to deliver long-term water security, water quality, amenity, recreation, and public health outcomes for Greater Sydney.	✓	✓		

Western Sydney Parklands Plan of Management

The Western Sydney Parklands Plan of Management (Western Sydney Parklands Trust, 2018) aims to safeguard and enhance the 5,280 ha of parklands that stretch from Quakers Hill in the north to Leppington in the south. Although not owned by Greater Sydney Parklands, Prospect Reservoir and its surrounds are within Precincts 7 and 8 of the Western Sydney Parklands.

The PPTP is located within Precinct 8 – Prospect Reservoir and Nature Reserve. The objective of this precinct is to support WaterNSW, Sydney Water and NPWS to protect water supply quality, maintain water, dam infrastructure and bushland resources and protect their cultural heritage values. The proposal contributes to this objective as it involves the construction of important water treatment infrastructure on Sydney Water and WaterNSW land.

5.2 Environmental legislation

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

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

Table 5-2 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Fairfield Local Environmental Plan (LEP) 2013 Blacktown LEP 2015	The proposal is in the Fairfield and Blacktown local government areas (LGAs). The study area is not zoned under either of these LEPs as it is in the Western Sydney Parklands and is subject to the provisions of Chapter 7 of the State Environmental Planning Policy (Precincts – Western Parkland City) 2021.
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Section 2.159 of the TISEPP permits development by or on behalf of a public authority for the purpose of water treatment facilities without consent on land in a prescribed zone. The proposal involves upgrading a water treatment facility including development of a pre-treatment plant and associated infrastructure. The proposal would be carried out by Sydney Water (a public authority) and is in a prescribed zone (in accordance with the Precincts – Western Parkland City SEPP as outlined below). The proposal is permissible without consent.
State Environmental Planning Policy (Precincts – Western Parkland City) 2021 (Precincts – Western Parkland City SEPP)	**Western Sydney Parklands (Chapter 7)** The works are on land to which Chapter 7 of this SEPP applies. Under section 7.8(2), the proposal site is unzoned. Section 7.5A(2) of the SEPP states that Western Parklands is taken to be a prescribed zone for the purposes of Part 2.3 of the TISEPP. With the application of this clause, the proposal is permissible without consent under section 2.159 of the TISEPP.

Environmental Planning Instrument	Relevance to proposal
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BCSEPP)	**Vegetation in non-rural areas (Chapter 2)** The proposal is in an area or zone listed in subsection 2.3(1). However, subsection 2.4(1) states: '*This Policy does not affect the provisions of any other SEPP….*', and as the works are permissible under the TISEPP, a council permit to clear vegetation under this SEPP is not required. **Water catchments (Chapter 6)** Chapter 6 of this SEPP applies as the proposal is within the Sydney Drinking Water Catchment, a regulated catchment area. Section 6 of this REF assessed potential environmental impacts on water quality and quantity, aquatic ecology, flooding, access, cultural heritage, flora and fauna and scenic quality. The assessment confirmed that potential impacts are minor and meet the requirements of part 6.2 of the SEPP. In accordance with section 171A of the EP&A Regulation, an assessment of neutral or beneficial effect (NorBE) on water quality was undertaken. The assessment confirmed that potential impacts are neutral.
State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP)	Water treatment facilities are identified in clause 4(1) of Schedule 3 of the Planning Systems SEPP as being State Significant Infrastructure should the capital investment value be greater than $30 million. The proposal has a value which exceeds $30 million and would be considered State Significant Infrastructure, were it not for clause 4(1A) of the SEPP which excludes development for the purpose of upgrading water treatment facilities carried out by or on behalf of Sydney Water Corporation.

Table 5-3 Consideration of key environmental legislation

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Protection of the Environment Operations Act 1997 (POEO Act)	Construction and operation of the proposal is not a scheduled activity. However, an EPL for pollution of waters is required for operational discharges to Prospect Reservoir that contain residual water treatment chemicals.	EPL	Prior to operation, Sydney Water
Biodiversity Conservation Act 2016 (BC Act)	The BC Act lists species and ecological communities which are protected in NSW. The impact of the proposal on threatened species, communities and their habitats has been assessed in Section 6.2.3.	N/A	N/A

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	Section 7.3 of the BC Act requires that the significance of the impact on threatened species and endangered ecological communities or their habitats is assessed using a five-part test. Where a significant impact is likely to occur, a species impact statement (SIS) must be prepared in accordance with the Environment Agency Head's requirements, or a Biodiversity Development Assessment Report (BDAR) must be prepared by an accredited assessor in accordance with the Biodiversity Assessment Method (BAM). Assessments of significance were conducted for threatened entities with the potential to occur in the study area (Appendix D). These assessments concluded that the proposal is not likely to result in a significant impact upon any threatened entity listed under the BC Act. Therefore, a SIS or BDAR is not required.		
National Parks and Wildlife Act 1974 (NPW Act)	The proposal is adjacent to land reserved under the NPW Act (Prospect Nature Reserve) but will not impact the reserve. Under Section 86 of this Act, it is an offence to harm or desecrate an Aboriginal place or object unless authorised by an Aboriginal heritage impact permit (AHIP). An Aboriginal Heritage Due Diligence (Appendix E) found the proposal will not impact Aboriginal heritage and an AHIP is not required.	N/A	N/A
Heritage Act 1977	The Heritage Act aims to promote conservation of heritage items in NSW. Part 3A establishes a State heritage register for the listing of heritage items including places, buildings, works, relics, moveable objects, precincts or land. The proposal would be undertaken within the curtilage of an item listed on the State heritage register (Prospect Reservoir and Surrounding Area, SHR 01370). A heritage impact assessment (Appendix E) was undertaken for the proposal and a section 60 approval under the Heritage Act is required prior to construction.	s60 approval	Pre-construction, Sydney Water

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Fisheries Management Act 1994 (FM Act)	The FM Act protects threatened species, populations, and communities of fish and marine vegetation, as well as commercial and recreational fishing areas in NSW waters. If the proposal involves dredging work (excavation in water land) or obstructs fish passage in KFH, and/or harms marine vegetation then a permit from DPI Fisheries may be needed. Prospect Reservoir is mapped as KFH. DPI Fisheries have been notified of the work required within KFH in accordance with section 199 of the FM Act.	Notification	Pre-construction, Sydney Water
Water Act 1912/ Water Management Act 2000	All dewatering activities require an approval under Section 91B of the *Water Management Act 2000.* Section 60A of the Act states that it is an offense to take water without a licence. A Water Access Licence (WAL) is required under section 61 where groundwater extraction will be greater than 3 ML. A water supply work approval (WSWA) is required under Section 90(2) of the Act to construct or use a water supply work. It is anticipated that less than 3 ML of groundwater is likely to be extracted from excavations during construction. A WSWA will be obtained prior to dewatering.	WSWA	Pre-construction, Sydney Water
WaterNSW Act 2014 (WaterNSW Act)	Parts of the proposal are on WaterNSW land in the Prospect Schedule 1 Special Area. Under the WaterNSW Act, WaterNSW controls development and activities by public authorities within designated Special and Controlled Areas. The WaterNSW Act requires either notice to and/or approval from WaterNSW before public authorities undertake activities within these areas. Sydney Water owned land is considered private land and is excluded from the Special Areas. In 1999, Sydney Water and WaterNSW entered into a Raw Water Supply Agreement (RWSA) to	REF review by WaterNSW	Pre-construction, Sydney Water

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	provide the basis for ongoing commercial, operational and planning relationships between the two organisations. The latest revision of the RWSA was signed by both agencies in October 2013. The RWSP supplements the RWSA. Section 3.7 of the RWSP provides written consent for Sydney Water to enter Schedule 1 and Schedule 2 Special and Controlled Areas under clause 9 of the Water NSW Regulation 2020 for the purposes of certain low impact activities. The protocols also outline notification requirements for Sydney Water and WaterNSW prior to undertaking work on each other's land. The proposal is considered a Type C activity in line with the RWSP. As a Type C activity, Sydney Water is required to consult with WaterNSW and allow WaterNSW to review and comment on the REF prior to determination. The Sydney Water project manager is responsible for ensuring that the RWSP are followed when undertaking work on WaterNSW land.		
Roads Act 1993	The works occur mostly on private land and would be accessed using local roads under the control and management of Blacktown and Fairfield City Council. The works are not within 100 m of a traffic signal and are not located on a classified road. Therefore, a ROL from Transport for NSW (TfNSW) is not required. However, a ROL may be required from council for the proposed access modifications on Ferrers Road at Gate 10.	Road Occupancy Licence	Pre-construction, contractor
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Matters of National Environmental Significance (MNES) relevant to the proposal include nationally threatened species and ecological communities. A Biodiversity Impact Assessment (Appendix D) confirmed that:	N/A	N/A

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	• it is unlikely that a significant impact on a MNES will result from the proposal • a referral of the proposed action to the Australian Government Minister for the Environment for approval under the EPBC Act is not required.		
Biosecurity Act 2015	This Act provides the framework to protect the community from the adverse effects of animal and plant pests, diseases and weeds The Act also provides the framework to help protect our environment from invasive pests and diseases. The study area contains several weed species which are listed under the Act and have an associated biosecurity duty. These weeds and appropriate mitigation measures have been discussed in Section 6.2.3 of this REF.	Compliance with biosecurity	Construction, contractor

6 Environmental assessment

Section 6.1 describes the existing environment. Section 6.2 provides more specific descriptions of the existing environment in relation to particular environmental aspects while also assessing direct and indirect impacts of construction and operation**.** It also identifies mitigation measures to minimise impacts. These will be incorporated into contract documents and a Construction Environmental Management Plan (or similar) prior to starting work and an Operation Environmental Management Plan or equivalent, prior to operation of the PPTP.

6.1 Existing environment

The PPTP is on Sydney Water and WaterNSW owned land, off Ferrers Road, Horsley Park in the Blacktown and Fairfield LGAs. The study area is bordered by Prospect Nature Reserve to the north, Prospect Reservoir to the east, Sydney Water land to the south, and Ferrers Road to the west.

Nearby receivers include industrial businesses like Austral Bricks, about 300 m west of the site and the Eastern Creek Speedway, about 750 m northwest of the site. An industrial estate lies about 1.2 km southeast of the site. The nearest residential properties are about 800 m southwest.

The study area has been significantly disturbed during construction of the reservoir and associated water treatment infrastructure. An open water channel (Channel 1) runs through the site that supplies raw water from Warragamba Dam to the Prospect WFP. Water from this channel can also be diverted to the reservoir via Channel 7.

Prospect Reservoir, adjacent to the site, is owned and managed by WaterNSW. It forms part of the Prospect Schedule 1 Special Area, where public access is restricted to protect the drinking water storage.

Vegetation in the study area includes three threatened ecological communities and large areas of exotic grassland. The vegetation is in poor condition due to historic land use and clearing. Prospect Reservoir and its surrounding area is heritage-listed at both local and state levels. There is one Aboriginal heritage item, a felled scarred tree, within the study area.

The existing environment is detailed further in Section 6.2.

6.2 Environmental aspects, impacts and mitigation measures

6.2.1 Topography, geology and soils

Existing environment

The topography of the study area generally slopes in a south-easterly direction, towards Prospect Reservoir. The study area is underlain by Bringelly Shale of the Wianamatta Group. The soil landscape is comprised of residual Blacktown soils with dominant soil materials being loam, clay

loam and clay. This soil landscape typically contains moderately reactive, highly plastic subsoil, low soil fertility and poor soil drainage.

A search of the EPAs contaminated land record database (EPA, 2020a) and the list of NSW contaminated sites notified to the EPA (EPA, 2020c) undertaken on 8 October 2024 returned no records of contaminated land or sites within 1 km of the study area.

A Contamination and Groundwater Assessment (GHD, 2023b) was undertaken as part of the reference design. Potential contamination sources within the study area were identified based on historical land use, including:

- runoff of hazardous materials from existing infrastructure
- heavy metal contamination from existing infrastructure and buildings
- uncontrolled fill
- pesticide and herbicide use.

Soil samples were analysed for the presence of asbestos and contaminants of potential concern (CoPC). These CoPC included total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides and organophosphorus pesticides (OCP/OPP), polychlorinated biphenyl (PCB) and heavy metals.

Concentrations of CoPC were below the adopted human health and ecological screening level criteria in all samples. There were some heavy metal exceedances of the ecological investigation criteria for copper, nickel and zinc. Overall, soils within the study area pose a low risk to human health and low to moderate risk to ecological receptors.

Additionally, the proposal:

- is in an area with moderate salinity potential (DECCW, 2002)
- is not in an area impacted by an existing exploration or mining title
- is not in an area impacted by acid sulfate soils (DPIE, 2023).

Potential impacts - construction

Construction

During construction, we will need to disturb ground, excavate and stockpile large volumes of spoil.

Topsoil will be stripped in preparation for construction and stockpiled on site for later reuse. Following topsoil stripping the site surface will be reprofiled to create a level foundation. Minor grading may also be required within the proposed construction compound to create a level surface.

Excavation up to 5 m deep is required to construct the Densadeg and RWPS. A cross section of the Densadeg excavation, including benching is shown in Figure 6-1. The estimated volume of cut (excavated material) and fill (placed material) required during construction is summarised in Table 6-1.

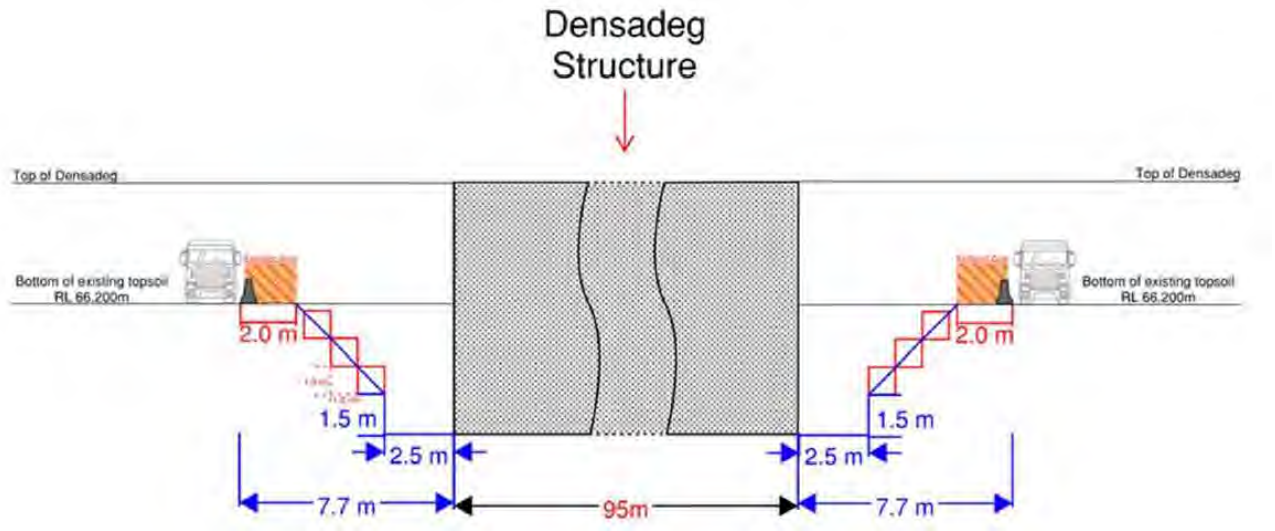

Figure 6-1 Densadeg excavation cross section

Table 6-1 Earthworks balance

Cut	Fill	Spoil surplus
-41,000 m^3	+5,900 m^3	+35,100 m^3

Excavated material will be stockpiled outside of flood-prone areas, away from drainage lines and on level surfaces. Stockpiles would be established for a relatively short duration before the material is reused for backfilling, restoration or transported off-site. Water quality impacts associated with the stockpiling of materials are outlined in Section 6.2.2.

Ground disturbing activities have the potential to cause erosion and sedimentation. Excavation will expose soil and increase the risk of soil mobilising during rain or windy conditions. If not adequately managed, construction activities could potentially result in the exposure of saline soils. This can impact the quality of surface water, groundwater and soil and may damage or corrode infrastructure.

Potential impacts - operation

The proposal will result in permanent changes to the surface topography and permeability of the study area. The amount of hardstand areas within the PPTP site will increase substantially. The general direction of surface run-off is not expected to change. Stormwater impacts are outlined in Section 6.2.2.

No other impacts to topography, geology and soils are expected during operation.

Mitigation measures

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

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

Mitigation measures
Prevent sediment moving offsite in accordance with *Managing Urban Stormwater, Soils and Construction, Volume 1 and 2A* (Landcom 2004 and DECC 2008), including: • develop a Soil and Water Management Plan (SWMP) as part of the CEMP • divert surface runoff away from disturbed soil and stockpiles • install sediment and erosion controls before construction starts • reuse topsoil where possible and stockpile separately • inspect controls at least weekly and immediately after rainfall • rectify damaged controls immediately • remove controls once surfaces have been stabilised, including removing trapped sediment in drainage lines. Include a Stockpile Management Plan (SMP) as part of the SWMP to adequately manage any proposed temporary and permanent stockpiles. This will include detail on: • exact location of stockpiles • minimising stockpile size • height, slopes and batters • preventing mixing and cross contamination • consideration of future maintenance • capping • erosion and sediment control • restoration. The SMP will be prepared by the delivery contractor and approved by the Sydney Water Project Manager in consultation with the Environmental Representative and Contamination and Hazardous Materials team.
Minimise ground disturbance and stabilise disturbed areas progressively.
Delivery contractor to ensure imported material is Virgin Excavated Natural Materials (VENM) or meets a relevant NSW EPA Resource Recovery Order and Resource Recovery Exemption, or is a commercially supplied material that is not waste. If using materials that are subject to a NSW EPA Resource Recovery Order/Exemption the contractor must ensure the conditions in that Order/Exemption are strictly adhered to.
Stop work in the immediate vicinity of suspected contamination. Indicators of contamination include discoloured soil, anthropogenic material within fill, asbestos, chemical or petrol odours and leachate. Contain disturbed material on an impermeable surface and cordon areas off. Notify the Sydney Water

Mitigation measures
Project Manager and the Major Projects Environmental Representative (who will contact the Contamination and Hazardous Materials team) to agree on proposed management approach.
Stop work during heavy rainfall or in waterlogged conditions when there is a risk of sediment loss off site.
Sweep up any sediment/soil transferred off site at least daily, or before rainfall.
Eliminate ponding and erosion by restoring natural landforms to the pre-works condition.
Adopt appropriate soil salinity mitigation measures in accordance with Western Sydney Salinity Code of Practice (Western Sydney Regional Organisation of Councils, 2003). This may include: • establish salt tolerant species in existing or potential salinity problem areas after construction • stabilise existing areas of erosion • minimise water use on site • avoid rotation and vertical displacement of the original soil profile • backfill excavations deeper than one metre in the same order, or treat or use this material as fill at depths more than one metre from the finished level.

6.2.2 Water and drainage

A Surface Water and Hydrology Assessment was completed by GHD in 2023 as part of the reference design. The PPTP capacity has since been reduced from 1000 ML/d to 500 ML/d and the sludge lagoon and new discharge structure are no longer required. The impacts of this smaller plant are equal/less than those assessed, with no change to the treatment process and quality of discharges, similar discharge volumes and significantly lower flow rates. The MUSIC modelling has been updated to reflect the smaller plant. The relevant findings of this assessment are summarised here and the complete report is provided in Appendix C.

Existing environment

The proposal is adjacent to Prospect Reservoir, a drinking water dam built in 1888 on Prospect Creek. The reservoir can hold 50,200 ML, with an operating capacity of 33,330 ML, an average depth of 9 m and a maximum depth of 22 m.

Raw water in Prospect Reservoir comes from Warragamba Dam, the Upper Canal system and local rainfall. Raw water is periodically drawn from Prospect Reservoir to the Prospect WFP via two raw water pumping stations.

The reservoir's primary purpose is to store bulk drinking water. The reservoir is artificially de-stratified using an aerator to maintain good water quality. Alum dosing was used until the 1990s to reduce turbidity and remove colour, creating an alum sludge layer on the bottom of the reservoir now covered with algae.

Catchment

The proposal is within the Sydney Drinking Water Catchment. The reservoir and surrounding WaterNSW land form part of the Prospect Schedule 1 Special Area. Public access is restricted in the Special Area to protect water security. Sydney Water owned land is excluded from the Special Area.

Local drainage and flooding

Most of the study area sits above the Probable Maximum Flood (PMF) level, with only the immediate periphery of the reservoir below the PMF. There is minimal catchment located upstream of the site which results in minimal overland flow.

Groundwater

The proposal is in the Sydney Basin Central groundwater source. Groundwater levels range between 4.4 and 8.2 m below ground level across the study area. Groundwater is highly saline across the site.

Water quality criteria

The raw water quality that WaterNSW must supply to Prospect WFP in accordance with the RWSA is outlined in Table 6-3. This same supply (from Warragamba Dam via Channel 1) will be the raw water source for the PPTP.

Table 6-3 RWSA - Prospect WFP

	Turbidity (NTU)	True Colour$_{400nm}$ (CU)	Total Aluminium (mg/L)	Total Manganese (mg/L)	Total Iron (mg/L)	Hardness (mg/L as $CaCO_3$)	Alkalinity (mg/L as $CaCO_3$)	pH (units)	Algae (ASU)[1]
Prospect WFP	40	60	2.6	1.4	3.5	25-70	15-60	N/A	1000

[1]If turbidity is greater than 10 NTU or true colour is greater than 30 CU, then the maximum Algae criteria will be 500 ASU.

Sydney Water and WaterNSW have also developed RWSPs which set out a framework for how both organisations interface and interact in relation to delivery of raw and treated water. The preferred operational raw water quality targets for water supplied by WaterNSW to Prospect WFP are outlined in the RWSP and are summarised in Table 6-4. If the raw water is outside of these targets, then the parties work together to assess likely impacts on treatment processes and develop appropriate responses.

Table 6-4 RWSP - Operational raw water quality preferred targets for WNSW supply to SWC

	Turbidity (NTU)	True Colour$_{400nm}$ (CU)	Filterable Iron (mg/L)	Filterable Manganese (mg/L)	Total Organic Carbon (mg/L)	pH (units)	Algae (ASU)	Toxic Algae (cells/mL)	Odour (Rating)	MIB (ng/L)	Geosmin (ng/L)	MIB + Geosmin (ng/L)
Prospect WFP	<7	<10	<0.1	<0.01	<4	>6.3 or <7.8	<100	<2000	≤2	<3	<3	<4

Note:

1. Although these values provide individual limits, they may change, subject to demands and in combination with other parameters.
2. Turbidity directly affects the amount of chemicals required for treatment and consequently, limits the WFPs production rate. The numbers are based on combined filter turbidities <0.5 NTU. Moving towards the 2011 ADWG health-based targets of individual filter turbidities of 0.15 NTU and never >0.5 NTU may change these values.
3. Although true colour is not directly a health issue, it will affect the WFPs ability to treat. Additional monitoring at 420nm (at true and apparent colour) may be required.
4. Iron and Manganese can impart an undesirable taste to water and stain laundry. Filterable iron and filterable Mn can precipitate in the distribution network and cause dirty water, taste, and odour issues.
5. It is crucial for raw water to be supplied at a steady pH with minimal fluctuations.
6. Certain species of algae can clog filters at lower concentrations. Macroinvertebrates can also exhibit same symptoms on filters. Operational target, based on Microcystis aeruginosa.
7. Methyl-isoborneol (MIB) and Geosmin are odour imparting compounds.

Raw water from Prospect Reservoir is generally accepted for treatment at Prospect WFP if it meets the water quality guidelines shown in Table 6-5. Different water quality criteria apply at RPR6 (the inlet to the WFP from the reservoir) and at the WFP itself.

Table 6-5 RWSP - Prospect Reservoir water quality acceptance guidelines for treatment at Prospect WFP

Parameter	Units	Prospect Reservoir (RPR6)	Prospect WFP*
Critical parameters			
Geosmin	ng/L	<12	<3
MIB	ng/L	<12	<3
Geosmin + MIB	ng/L	<16	<4
Algae	ASU	<2,650	<500

Potential Toxin Producing BGA	Cells/mL	<2,000	<1,500
E.coli	CFU/100mL	<500	<500
Fluoride	mg/L	<5	<1
Odour	-	<5	<5
Additional parameters			
Turbidity	NTU	<7	<7
True colour	400 nm	-	10
True colour	420 nm	-	20
Filterable Manganese (mg/L)	mg/L	-	0.01
Total Manganese (mg/L)	mg/L	-	-
Alkalinity	mg/L	>5	>21
Cryptosporidium	Oocysts/10L	<10	<10
Giardia	Cysts/10L	<10	<10
pH	units	-	-

*Prior to pumping, acceptable water quality is determined by calculating the hypothetical concentrations in a mixture, based on water quality parameters of component sources, weighted for the proposed mixture composition.

The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2018) provide a guide for setting water quality objectives to sustain current and future environmental values for natural and semi natural water resources in Australia. The guidelines provide default trigger values for physical and chemical stressors at which an effect on aquatic systems is observed. The default trigger values for minimally disturbed freshwater lakes and reservoirs are shown in Table 6-6 and are considered conservative for Prospect Reservoir.

Table 6-6 Water quality trigger values for freshwater reservoirs

Analyte	Units	Guideline trigger value
pH	Units	6.5-8.0
Chlorophyll a	ug/L	<5
Dissolved oxygen	% sat	90-110
Total nitrogen	mg/L	<0.35

Analyte	Units	Guideline trigger value
Total phosphorus	mg/L	<0.01
Turbidity	NTU	<20
Total manganese	mg/L	<1.9
Total aluminium	mg/L	<0.055

Water quality trends

WaterNSW is responsible for managing Prospect Reservoir and conducting water quality monitoring for compliance and operational decision-making. Water quality monitoring stations relevant to the proposal include:

- COMP2 on the Warragamba to Prospect pipeline.
- RPR1 in the middle of Prospect Reservoir
- RPR6 at the inlet to the WaterNSW RWPS from Prospect Reservoir .

The feed water for the PPTP is drawn from Warragamba Dam via the Warragamba to Prospect pipeline. Water quality in this pipeline is measured at COMP2. COMP2 is upstream of a chlorine dosing station (WT0016) which means water quality reaching Prospect WFP differs from the COMP2 data for some parameters (such as true colour) when WT0016 is operating.

Water from the Warragamba to Prospect pipeline is also used to top up Prospect Reservoir. Water quality at RPR1 and RPR6 represents the water quality in the reservoir at the mid lake and inlet to WaterNSW RWPS, respectively.

A historic analysis of monitoring data at these sites between 2008 and 2022 was conducted to establish baseline water quality and to inform the PPTP design envelope. Water quality at these locations was generally within guideline limits, with some exceedances. A summary of the water quality results is provided in Table 6-7.

Water quality from the Warragamba to Prospect pipeline is generally better than Prospect Reservoir as it has been selectively drawn from the deep storage of Warragamba Dam. This water can be expected to almost always meet the RWSA parameters. Monitoring data indicates that water quality is consistently within guideline limits for most parameters including true colour, turbidity, total aluminium, total manganese, total iron, *E.coli* and total suspended solids (TSS).

Water quality in Prospect Reservoir is generally lower than in the Warragamba to Prospect pipeline. The reservoir receives inflows from the Warragamba to Prospect pipeline and from Upper Canal, which typically has lower water quality than the pipeline. Detention in the shallow storage of Prospect Reservoir can also impact water quality. Water quality in the reservoir usually meets the RWSA parameters. The data indicates that the concentrations of true colour, total aluminium, total manganese, total iron, and *E.coli* all met their respective guidelines. However, several parameters exceeded the guidelines in some samples.

WaterNSWs annual report on water quality indicates that for the 2022-23 reporting period water quality in Prospect Reservoir returned a significant number of exceedances of the ANZECC guidelines for nitrogen and aluminium, but was of generally good quality and posed few challenges for treatment at Prospect WFP.

Raw water supplied for filtration remained of high quality throughout the period with no exceedances recorded beyond a small number of samples at Prospect WFP which failed to meet the guidelines for alkalinity and hardness. These exceedances did not impact the ability of the plant to treat the water to ADWG standards.

The intent of the PPTP is to produce water that:

- is equal or better quality than the raw water, with 'better' meaning no negative impacts on the WFP
- meets the Prospect WFP RWSA for all water quality parameters.

Many of the key water quality parameters will only be improved by pre-treatment (such as turbidity, true colour, algal concentrations and total iron).

Table 6-7 Summary of raw water quality in the Warragamba to Prospect pipeline (COMP2) and Prospect Reservoir (RPR1 and RPR6) between 2008 to 2022

Monitoring station		True Colour$_{400nm}$	Turbidity (NTU)	Total Aluminium (mg/L)	Total Manganese (mg/L)	Total Iron (mg/L)	E. coli (CFU/100 mL)	Chlorophyll-a (µg/L)	pH (Units)	Conductivity (µS/cm)	Total Suspended Solids (mg/L)	Total Organic Carbon (mg/L)	Hardness CaCO3 (mg/L)	Alkalinity (mg/L)	Algal Bio-volume (mm^3/L)	Algal Aerial Standard Units (ASU)	Toxic Blue-green algae Bio-volume (mm^3/L)
COMP2	N	414	736	459	459	458	262	407	624	192	388	481	394	436	212	212	212
	Minimum	3	0.39	0.01	0.002	0.03	0	0	6.33	110.5	0	3	31	14	0	0	0
	Median	13	3.8	0.14	0.012	0.23	1	0.5	7.19	178.6	2	5.8	50	38	0.15	74.6	0
	Maximum	38	33.5	1.49	0.587	1.25	22	14.2	7.84	267	14	53	98	65	2.07	1936	0.035
	Average	15.7	6.6	0.24	0.046	0.30	1.6	0.9	7.19	179.5	2.6	5.9	47.3	39.0	0.25	127.4	0.001
	Outside guideline (N)	0	0	0	0	0	0	3	4	192	0	441	2	7	N/A	2	0
	Outside guideline (%)	0	0	0	0	0	0	0.7	0.6	100	0	91.7	0.5	1.6	N/A	0.9	0
RPR1	N	1,502	3,178	1,452	1,726	1,081	960	1,384	3,164	6,673	718	1,450	657	1,609	1,367	1,367	1,366
	Minimum	1	0	0	0	0	0	0.2	4.45	88.7	0	1	16	0	0.026	30	0
	Median	3	1.2	0.04	0.011	0.06	1	3.5	7.60	159.6	2	3.6	38	29	0.72	517	0
	Maximum	25	110	0.7	1.14	0.89	340	15.8	8.76	244.8	88	46	62	66	14.06	5509	0.486
	Average	4.2	1.7	0.05	0.017	0.09	4.0	4.1	7.56	160.5	2.3	4.0	39.5	30.8	1.06	758.9	0.004
	Outside guideline (N)	0	9	0	0	0	0	301	2496	6673	1	329	12	9	N/A	322	1
	Outside guideline (%)	0	0.03	0	0	0	0	21.7	7.9	100	0.1	22.7	1.8	0.6	N/A	23.6	0.07
RPR6	N	981	1,176	1,017	1,281	716	536	528	1,158	2,519	371	985	193	1,203	1,446	1,447	1,446
	Minimum	1	0	0.01	0.001	0	0	0	6.4	7	0	1.4	22	3	0	0	0
	Median	3	1.4	0.04	0.01	0.07	2	3.7	7.70	151.8	2	3.6	40	31	0.70	472	0

Monitoring station		True Colour$_{400nm}$	Turbidity (NTU)	Total Aluminium (mg/L)	Total Manganese (mg/L)	Total Iron (mg/L)	E. coli (CFU/100 mL)	Chlorophyll-a (µg/L)	pH (Units)	Conductivity (µS/cm)	Total Suspended Solids (mg/L)	Total Organic Carbon (mg/L)	Hardness CaCO3 (mg/L)	Alkalinity (mg/L)	Algal Bio-volume (mm^3/L)	Algal Aerial Standard Units (ASU)	Toxic Blue-green algae Bio-volume (mm^3/L)
	Maximum	21	40.36	0.43	0.098	0.75	690	15.1	8.93	232.7	45	40.1	62	62	14.86	5,636	0.182
	Average	4.8	1.8	0.05	0.013	0.08	20.0	4.2	7.70	158.0	2.4	3.8	40.3	32.1	1.02	716.2	0.003
	Outside guideline (N)	0	2	0	0	0	0	133	1444	2513	0	168	5	9	N/A	331	0
	Outside guideline (%)	0	0.02	0	0	0	0	25.2	12.5	99.8	0	17.1	2.6	0.7	N/A	22.9	0
	Guideline used[1]	60*	40*	2.6*	1.4*	3.5*	1000[#]	5[#]	6.5-8.0[#]	30*	80[##]	4[###]	25-70	15-60	N/A[+]	1000	0.4

[1] Guidelines used are either raw water quality agreement (denoted by *), or the most relevant ANZECC Freshwater Ecosystem protection guidelines (denoted by [#]); USA Guideline (denoted by [##]) or Canadian Ambient Water Quality Guideline for Organic Carbon in source water (denoted by [###]).

[+] In the absence of a guideline for total algal bio-volume, the Cyanobacterial amber alert guideline (0.4 -4.0 mm^3/L for toxic species) was used in this assessment, as there have been toxic species present at low abundance, intermittently, in the reservoir. The red alert guideline is for total algal biovolume (>10 mm^3/L), but only in the presence of toxic species.

Potential impacts - construction

Erosion and sedimentation

During construction, there is potential for sediment laden runoff from exposed areas (including stockpiles) to enter Prospect Reservoir and impact water quality. Reduced raw water quality in Prospect Reservoir has the potential to subsequently impact the operation of the WFP as raw water is sometimes sourced from Prospect Reservoir. Onsite detention basins will be constructed during site establishment to capture and treat runoff from construction areas. Captured stormwater will be re-used on site, where possible, for dust suppression and conditioning earthworks materials. Best practice erosion and sediment controls will be implemented to minimise water quality impacts.

The proposal would involve works at the edge of Prospect Reservoir to construct the bioretention basin outlet drains and relocate existing stormwater pipes. These works would be constructed within a coffer dam to minimise water quality impacts or when reservoir levels are suitably low. Works at the reservoir edge could result in potential short-term water quality impacts, these would be minimised by implementing the mitigation measures in Table 6-13.

Water quality impacts could also occur during construction from fuel or chemical spills from construction vehicles or site compounds. These impacts would be minimised by implementing the mitigation measures outlined below.

Groundwater

Groundwater inflows are expected when excavation extends near or below the groundwater table. Groundwater testing revealed seepage into excavations will be extremely slow and can be adequately managed by pumping/dewatering in small quantities. Based on known inflows, groundwater level, construction method and schedule, it was determined that the volume of groundwater extracted for the duration of the proposal would likely be below 3 ML. A WSWA must be obtained prior to any groundwater dewatering. Groundwater is highly saline and may require further treatment before being re-used on site. No groundwater will be discharged to Prospect Reservoir.

Discharges to Prospect Reservoir

The expected construction and commissioning discharges from the PPTP to Prospect Reservoir are summarised in Table 6-9. These scenarios relate to discharge of stormwater, raw water, screened raw water and pre-treated water. The impact of these discharges were assessed based on their volume, frequency, quality and location and they are not expected to negatively impact hydrology or water quality.

The quality of water discharged to Prospect Reservoir is expected to be comparable to current conditions or better quality in some cases.

Most scenarios involve discharge of raw or partially treated water to the reservoir. Raw water quality varies. Based on the historical median, raw water quality is expected to have a pH of around 7.2, turbidity of around 4NTU and a true colour of 13HU_{400nm} (see Table 6-7). Raw water discharges routinely occur as part of the normal operation of the reservoir. Water levels in the reservoir are topped up from the Warragamba to Prospect pipeline at a rate of up to 750 ML/day. These flows, along with poorer quality inflows from the Upper Canal, make up a large portion of the reservoir's water. The proposed works are not expected to have negative impacts unless discharge volumes/flow rates greatly exceed current operations.

Jar testing, pilot and prototype trials have been completed on raw water from Warragamba Dam (and similar blends) to optimise the PPTP chemical dosing. The worst case, maximum concentration of residual chemicals in the pre-treated water were calculated based on these results and are shown in Table 6-8. The actual concentrations are likely to be much lower. These chemicals are commonly used in water treatment and react with natural matter in the raw water to form solids that settle in the PPTP, resulting in very little of these added chemicals escaping the process into the discharge. When added to water, ferric chloride will decompose into iron salts and chlorides and will slightly modify this parameter from the raw water. Overall the total iron content in the discharge is expected to be lower than the raw water.

Table 6-8 Maximum concentrations of residual chemicals in the PPTP discharges

Product	Maximum concentration (mg/L)	Purpose
Cationic polymer	3.6	Coagulant aid
Anionic polymer	1.0	Flocculant aid and dewatering polymer
Ferric Chloride (FeCl3)	3.5	Main coagulant

All water discharged to Prospect Reservoir will comply with the RWSA water quality parameters for Prospect WFP supply and will aim to meet the RWSP operational targets, where possible. The RWSA and RWSP (refer to Table 6-3 and 6-4) include thresholds relevant to the following parameters:

- Turbidity: <7NTU (operational target), 40 NTU
- True colour: <10 HU_{400nm} (operational target), 60 HU_{400nm}
- Total iron: 3.5mg/L

While there are no defined thresholds for polymer concentrations in raw water, turbidity can be used as an indicative parameter since polymers coagulate to form solids.

The quality of raw and pre-treated water will be closely monitored. Raw water samples will be collected from the outlet of the raw water pumping station before any chemicals are introduced and analysers will monitor true colour, UV254, turbidity, pH, oxidation reduction potential (ORP), total alkalinity, total chlorine and manganese.

Pre-treated water samples will be collected from the outlet channel of the PPTP and analysers will monitor the same parameters mentioned above, except total chlorine. Online monitoring will provide early warning to operators to address any process failures and minimise risk to water quality. All monitoring equipment will be calibrated regularly.

All discharges to the reservoir, except for stormwater, will occur via Channel 7. Channel 7 is concrete lined and designed to discharge flows of up to 2760 ML/d. The initial section of the channel where water enters the reservoir is armoured with 15 m of double layered DN150 rock rip-rap. This rip-rap acts as a stilling basin and protects against scouring. From here the channel feeds out to the reservoir over 60m and is rip-rap lined above 57.81 mRL. The maximum flow rate anticipated from the PPTP through Channel 7 is 750 ML/d. This is significantly less than the Channel is designed for and no scouring of the reservoir is expected.

Stormwater will be discharged to the reservoir via two piped outlets along the southern edge of the V40 sediment basin. The V40 sediment basin is designed to receive inflows from the Warragamba pipeline of up to 750 ML/d. The stormwater outlets will be set at a minimum slope of 0.35% with headwalls and scour protection to minimise any scouring or erosion during operation.

The WaterNSW RWPS intake is located approximately 800 m east of the Channel 7 outlet. Discharges from Channel 7 would mix with and be diluted by the greater volume of water within Prospect Reservoir before reaching the intake. Water quality will continue to be monitored at RPR6. No changes to the pumping station operation will be required.

Each discharge scenario is considered in more detail below.

Stormwater

Stormwater will be collected in detention basins during construction to minimise sediment laden run-off entering Prospect Reservoir. This water will need to be discharged intermittently, depending on rainfall. Run-off from disturbed areas may contain nutrients, sediment and other contaminants that could impact water quality. The quality of stormwater discharged during construction will be monitored with calibrated field testing equipment. Upon satisfactory field testing results, the water from these basins will be discharged to the reservoir using pumps and layflat hoses. All discharges will be carefully monitored and controlled to prevent erosion.

The basins will also include spillways designed to allow controlled overflow release during rainfall events that exceed the basin capacity. These spillways will be stabilised to prevent any scouring or erosion.

Hydrotesting

Raw water from Channel 1 will be used for hydrotesting concrete structures, pipework and steel tanks as construction of the PPTP progresses. Screened raw water will be used to test the overflow pipework to Channel 7. The volumes of test water discharged to the reservoir would be up to 31.25 ML/d. This volume is relatively small compared to the total volume in the reservoir (50,200 ML). Water that has come into contact with freshly laid concrete may have a raised pH. The delivery contractor will monitor the quality of the test water and correct pH to between 6.5 and 8 (if

needed) prior to discharge. Water used for hydrotesting is expected to be the same quality as the raw water supply used to top up the reservoir.

Commissioning

After construction of the PPTP, it will undergo a commissioning and operational testing phase to prove the performance of the treatment process prior to operation. Commissioning will involve operating the PPTP at different flow rates. High flow testing will only be conducted after all equipment and controls have been thoroughly tested to minimise the chance of a process failure. This means that while pre-treated water quality may fluctuate during commissioning (as the process is brought under control) it should always be better quality than the raw water from Channel 1. Overdosing of chemicals is unlikely to occur since there will be water quality and flow instruments within the PPTP to monitor and control chemical dosing and the process will be shutdown if control parameters are out of bounds.

The volumes of operational testing water discharged to the reservoir would be up to 500 ML/day. This is lower than the average peak flow rate of 750 ML/day used to top up the reservoir from the Warragamba to Prospect pipelines. If pre-treated water meets specifications it will be sent to the Prospect WFP instead. Operational testing water is expected to be better quality (lower colour, total iron and turbidity) than the raw water used to top up the reservoir.

As such, discharge events during the construction and commissioning phase are not anticipated to have a negative impact on water quality compared to current conditions.

Table 6-9 Expected discharges to Prospect Reservoir during construction and commissioning

Scenario	Water quality	Discharge location	Flowrate (ML/day)	Duration (hrs)	Volume (ML)	Frequency	Note
Construction							
Stormwater retention basin overflow and discharges	Stormwater	Reservoir	1	1 - 5	0.8	1 in 3 months	Frequency and duration depends on rainfall and basin capacity
Hydrotesting concrete structures	Raw water	Reservoir or Channel 1	15	20 - 30	17.7	Once	Frequency depends on successful testing
Hydrotesting pipework	Raw water	Reservoir or Channel 1	2	10 - 24	1	Once	Frequency depends on successful testing
Hydrotesting steel tanks	Raw water	Reservoir or Channel 1	8.8	5 - 10	3.2	Once	Frequency depends on successful testing
Channel 7 overflow pipework	Screened raw water	Channel 7 to Reservoir	750	1	31.25	Twice	Includes testing of water levels, free boards and fail sequence in PLC
Commissioning							
Commissioning discharges	Pre-treated	Channel 1	750	8	250	Twice	Frequency depends on successful commissioning
Operational testing	Pre-treated	Channel 1 or Reservoir*	Up to 500	1080 (45 days)	up to 22500	Once	Worst case volumes (likely to be lower) *Water will only be sent to the Reservoir instead of Channel 1if it is out of spec

Note: Raw water is expected to have a pH of around 7.2, turbidity of around 4 NTU and a true colour of 13 HU_{400nm}

Operational testing water will be of higher quality than raw water (lower turbidity, total iron and colour). Raw water pH will be adjusted if needed with calcium hydroxide or hypochloric acid to between 6.5 and 8. Any remaining turbidity contains solids coagulated with ferric chloride and polymers in the below maximum concentrations:

- ferric chloride = 3.5 mg/L
- cationic polymer = 3.6 mg/L
- anionic polymer = 1 mg/L.

Potential impacts - operation

Flooding

No impacts from regional flooding are anticipated during operation as most infrastructure will be above the PMF level. Reservoir levels will not change significantly due to the proposal and a weir will be installed to protect underground infrastructure from backwater impacts. The bioretention basins and outlet pipes are both below the PMF (but above the 2% AEP event) and could be impacted during extreme flood events.

Discharge to Prospect Reservoir

The expected operational discharges from the PPTP to Prospect Reservoir are summarised in Table 6-10. These scenarios relate to the discharge of off-spec pre-treated water only. The impact of these discharges were assessed based on their volume, frequency, quality and location and they are not expected to negatively impact hydrology or water quality.

Discharges to the reservoir may occur during the following scenarios:

- Starting the PPTP from hot standby or mothballed state.
- Stopping the PPTP suddenly (e.g. power failure).
- Pre-treated water quality is off-spec (e.g. process failure).

The characteristics of these scenarios are similar, in that:

- they involve the discharge of off-spec pre-treated water via Channel 7
- the volumes range between 1 and 104 ML, well within the mean peak flow rate of 750 ML/day used to top up the reservoir
- the discharges are infrequent, ranging from 8 times a year to 1 in 2 years.

Off-spec pre-treated water discharged to Prospect Reservoir will be better quality (lower colour, total iron and turbidity) than the raw water supply used to top up the reservoir. Off-spec pre-treated water will also contain low levels of residual treatment chemicals including ferric chloride (3.5mg/L), anionic polymer (1 mg/L) and cationic polymer (3.6mg/L). These chemicals coagulate to form solids which correlate to turbidity levels.

All pre-treated water discharged to Prospect Reservoir is expected to comply with the RWSA water quality parameters for Prospect WFP supply and will aim to meet the RWSP operational targets, where possible. The RWSA and RWSP (refer to Table 6-3 and 6-4) include thresholds relevant to the following parameters:

- Turbidity: <7NTU (operational target), 40 NTU
- True colour: <10 HU_{400nm} (operational target), 60 HU_{400nm}
- Total iron: 3.5mg/L

While there are no defined thresholds for polymer concentrations in raw water, turbidity can be used as an indicative parameter since polymers coagulate to form solids.

Operational discharge volumes would cumulatively lie within the range of 6 ML to 320 ML per annum. These releases would annually represent 0.01% to 0.6% of the total volume of the reservoir and would not result in any hydrological impacts on the available storage capacity of Prospect Reservoir or its operation.

Ongoing monitoring of these operational discharges will ensure compliance with the RWSA. As such, operational discharges are not anticipated to have a negative impact on water quality compared to current conditions.

Table 6-10 Expected operational discharges to Prospect Reservoir via Channel 7

Scenario	Water quality	Flowrate (ML/day)	Duration (hrs)	Volume (ML)	Frequency	Comment
Start up from hot standby	Off-spec pre-treated water	125	4	21	8 per year	Frequency depending on raw water conditions and operating model.
Start up from mothballed state		125	20	104	1 per year	Frequency depending on raw water conditions and operating model.
Power outage/sudden stoppage of plant		125	3	18	Unknown	Frequency unknown, power outages are unlikely given back up power supply.
One CBST off-spec		500	2.5	1.2	5 per year (1 per CBST)	
All CBSTs off-spec		500	2.5	6.3	Once every 2 years	
Partial drain of one CBST		500	2	1	20 per year (4 per CBST)	

Note: Raw water is expected to have a pH of around 7.2, turbidity of around 4 NTU and a true colour of 13 HU_{400nm}

Off-spec pre-treated water will be of higher quality than raw water (lower turbidity, total iron and colour). Raw water pH will be adjusted if needed with hydrated lime to between 6.5 and 8. Any remaining turbidity contains solids coagulated with ferric chloride and polymers in the below maximum concentrations:

- ferric chloride = 3.5 mg/L
- cationic polymer = 3.6 mg/L
- anionic polymer = 1 mg/L.

Stormwater

The proposal involves a substantial increase in impervious areas which will increase stormwater run-off. Stormwater run-off is likely to contain nutrients and other pollutants. As the proposal is located in the Sydney Drinking Water Catchment, adequate stormwater management is needed to achieve a NorBE on water quality.

The Model for Urban Stormwater Improvement Conceptualisation (MUSIC) was used to design a suitable stormwater treatment system. This system includes:

- a 230m^2 bioretention basin with gross pollutant trap (GPT) to capture and treat stormwater from the common access road catchment
- a 525m^2 bioretention basin with GPT to capture and treat stormwater from the PPTP site.

The bioretention basins were sized to achieve a 10 percent reduction in the pre-development mean annual pollutant loads for TSS, total phosphorous, total nitrogen and gross pollutants. The results of the MUSIC modelling with the above treatment system implemented are shown in Table 6-11. The modelled post-development annual pollutant loads show a greater than 10 percent improvement from the pre-development scenario. This demonstrates conceptually that a NorBE can be achieved for the proposal.

Table 6-11 MUSIC modelling pollutant load results

Scenario	Annual pollutant load (kg/yr)			
	Total suspended solids	Total phosphorus	Total nitrogen	Gross pollutants
Pre-development	2483.8	4.8	26.4	132.7
Post-development	522.6	2.2	20.4	16.4
NorBE? (Y/N)	Y	Y	Y	Y

Neutral or Beneficial Effect

Public authorities undertaking activities in the Sydney Drinking Water Catchment must consider whether those activities will have a NorBE. According to the NorBE on Water Quality Assessment Guideline (WaterNSW, 2022) a NorBE is satisfied if the activity:

- has no identifiable potential impact on water quality; or
- will contain any such impact on the site of the activity and prevent it from reaching any watercourse, waterbody or drainage depression on the site; or
- will transfer any such impact outside the site by treatment in a facility and disposal approved by a public authority (but only if the public authority is satisfied that water quality after treatment will be of the required standard).

Part of the proposal is in an area administered by WaterNSW and a NorBE assessment is required. The Sydney Water and WaterNSW – Joint Access Protocol applies and WaterNSW has reviewed the draft REF. The mitigation measures below incorporate the WaterNSW feedback received. The NorBE assessment (see Table 6-12) concluded that the proposal will have a neutral effect on water quality in Prospect Reservoir.

Table 6-12 NorBE assessment

NorBE assessment – will there be a NorBE on water quality?	
1. Are there any identifiable potential impacts on water quality? What pollutants are likely? *Major potential pollutants are sediments (fine and coarse), nitrogen, phosphorus, pathogens and hazardous chemicals and contaminants such as oil/fuel.* At what stage do the impacts occur? i.e. during construction and/or post construction?	The potential impacts on water quality from the proposal have been discussed in detail in Section 6.2.2 of this REF. The major potential pollutants of concern during construction are sediments (fine and coarse) and hazardous chemicals and contaminants such as oil/fuel. The major potential pollutants of concern during operation are the hazardous chemicals and contaminants stored on site required for the treatment process, residual water treatment chemicals in the water being discharged to Prospect Reservoir and urban stormwater runoff.
2. For each pollutant list the safeguards needed to prevent or mitigate potential impacts on water quality? *These may be WaterNSW endorsed current recommended practices (CRPs) and/or equally effective other practices)*	This REF includes various mitigation measures to protect water quality and mitigate potential impacts. Refer to mitigation measures listed in Table 6-2 and Table 6-13.
3. Will the safeguards be adequate for the time required? How will they need to be maintained?	Yes. The safeguards will be in place for the entire duration of the proposal. They will be maintained via daily inspections and regular site audits. All erosion and sedimentation controls will be designed to cope with expected seasonal weather conditions and will be maintained regularly in accordance with the mitigation measures in this REF to ensure they remain effective. Functioning spill kits (including aquatic spill kits) will be kept on site to clean up accidental chemical/fuel spills These kits will be kept well stocked and located for easy access. No fuels or chemicals will be stored within the Special Area. All chemicals and fuels will be stored in accordance with relevant Australian Standards and Safety Data Sheets within bunded areas with 110% capacity.

4. Will all impacts on water quality be effectively contained on the site by the identified safeguards (above) and not reach any watercourse, waterbody or drainage depression? Or will impacts on water quality be transferred outside the site for treatment? How? Why?	Yes. The recommended safeguards will be incorporated into a project specific CEMP and OEMP or equivalent. Sediment will be effectively contained on the site during construction provided the required erosion and sediment controls are properly installed and maintained. Stormwater runoff from the PPTP will be captured in bioretention basins to achieve a 10% reduction in pollutant loads to protect water quality. Potential drinking water quality impacts from discharges to Prospect Reservoir will be mitigated through treatment at Prospect WFP. These discharges are generally expected to be of higher quality than the raw water used to top up Prospect Reservoir under normal operating conditions.
5 Is it likely that a neutral or beneficial effect on water quality will occur?	A neutral effect on water quality is likely provided the mitigation measures in this REF are properly implemented and adequately maintained. The activity will not adversely impact water quality off site because pollutant loads that occur as a result of the activity can be transported to acceptable downstream treatment at the Prospect WFP. The main objective of the proposal is to improve water quality before it reaches the Prospect WFP.

Mitigation measures

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

Table 6-13 Environmental mitigation measures — water and drainage

Mitigation measures
Use appropriate controls to avoid potential sedimentation to waterbodies.
Silt curtains or a coffer dam should be deployed around work sites within Prospect Reservoir to protect against any impacts to water quality.
Water discharged from the coffer dam (during dewatering activities) into Prospect Reservoir must be monitored and undertaken in a manner that discharge water quality meets all relevant water quality requirements.

Mitigation measures
Coffer dam installation is to be undertaken, where possible, when water levels within Prospect Reservoir are low to minimise the disturbance of submerged sediments.
Consider the DPI Water Guidelines for Instream Works on Waterfront Land and for Outlets Structures on Waterfront Land during the design and construction of works within 40m of Prospect Reservoir to protect waterfront land.
Bund potential contaminants and store on robust waterproof membrane, away from drainage lines.
Keep functioning spill kit on site for clean-up of accidental chemical/fuel spills and aquatic spill kit on site for clean-up of accidental chemical/fuel spills in mapped KFH. Keep the spill kits stocked and located for easy access.
Locate portable site amenities, chemical storage and stockpiles of erodible materials away from watercourses, drainage lines and flood prone areas.
All stockpiles to be located outside of the PMF extent.
Sydney Water will obtain a groundwater Water Supply Works Approval and where dewatering is >3ML per water year (from 1 July) a Water Access Licence from NRAR will also be obtained. The delivery contractor is responsible for: • preparing a Dewatering Management Plan • complying with the approval conditions (such as protecting water quality; minimising aquifer extraction volumes, monitoring extraction with flow meters and recording volumes).
Groundwater is highly saline and must not be discharged to Prospect Reservoir. This mitigation measure must be documented in the Dewatering Management Plan.
Minimise groundwater ingress during detailed design. As part of the CEMP, prepare a Dewatering Management Plan for groundwater dewatering. This should include elements such as how water quality will be protected and how extraction volumes will be monitored.
Discharge treated drinking water in accordance with Sydney Water's Water Quality Management During Operational Activities Policy (D0001667) including erosion controls, discharge rate, dechlorination, monitoring. Re-use drinking/groundwater water where possible.
If discharge to the environment is not possible, seek approval and discharge criteria from the relevant Sydney Water Network Area Manager prior to discharge to the wastewater system. Otherwise tanker by a licensed waste contractor and dispose off-site to an appropriately licensed facility.
Store all chemicals and fuels in accordance with relevant Australian Standards and Safety Data Sheets. Record stored chemicals on site register. Ensure bunded areas have 110% capacity of the largest chemical container, or an additional 25% capacity of the total volume stored within (whichever is greater). Tightly secure chemicals and fuels in vehicles. Clearly label all chemicals.

Mitigation measures
Conduct refuelling, fuel decanting and vehicle maintenance in compounds where possible. If field refuelling is necessary, designate an area away from waterways and drainage lines with functioning spill kits close by.
Conduct any equipment wash down within a designated washout area away from drainage lines.
Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak-free item.
All incidents, spills or fire sightings that occur within Schedule 1 of 2 Special or Controlled Areas must be reported to WaterNSW Incident Number 1800 061 069 (24 hour service) and the Sydney Water project manager immediately. Where an incident is reported to WaterNSW that has or is likely to cause material harm to water quality or a catchment area, a written report detailing what occurred and the actions taken to combat the incident, including rectification actions would be prepared and submitted to WaterNSW within seven days of the incident occurring.
A testing and commissioning plan must be developed to ensure that all equipment and instruments are ready to operate before process commissioning begins to minimise discharge water quality risks.
Water quality monitoring of construction and operational discharges to Prospect Reservoir is required to confirm compliance with the RWSA. A discharge protocol must be developed and agreed with WaterNSW in accordance with the RWSP, to manage the notification and reporting of discharges including volume, duration and water quality parameters to Prospect Reservoir
Sydney Water will maintain the stormwater outlets on WaterNSW land to ensure they are operating as intended.
The final stormwater treatment system design must achieve a 10% reduction in total nitrogen, total phosphorous, TSS and gross pollutants to ensure a NorBE to water quality in Prospect Reservoir.

6.2.3 Flora and fauna

A Biodiversity Impact Assessment was completed by Biosis in October 2024. The findings of this assessment are summarised here and the complete report is provided in Appendix D.

Existing environment

Vegetation within the study area is in low condition due to historical clearing and modification. There are remnant patches of threatened ecological communities (TEC) present interspersed with large areas of exotic grassland. Whilst no threatened flora species were identified, habitat for numerous threatened fauna species is present within the study area.

There are no high priority groundwater dependent ecosystems mapped within the study area (DPE Water, 2022). The study area is mapped as bushfire prone land.

Vegetation types

The vegetation types and their extent within the study area are outlined in Table 6-14 and shown in Figure 6-2.

Table 6-14 Vegetation types within the study area

PCT	Description	Associated TEC (BC Act)	TEC listing	Vegetation condition	Extent (ha)
3962	Coastal Floodplain Phragmites Reedland	Sydney Freshwater Wetlands in the Sydney Basin Bioregion	Endangered	Moderate	0.05
3320	Cumberland Shale Plains Woodland	Cumberland Plain Woodland in the Sydney Basin Bioregion	Critically endangered	Low	11.17
4023	Coastal Valleys Riparian Forest	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Endangered	Low	0.66
N/A	Urban native/exotic	N/A	N/A	N/A	0.46
N/A	Exotic grassland	N/A	N/A	N/A	9.53

Figure 6-2 Ecological features within the study area

Priority weeds

Six priority weeds for the Greater Sydney Region, which includes the Fairfield and Blacktown LGA, have been recorded in the study area, and are listed in Table 6-15, along with their associated biosecurity duty in accordance with the *Biosecurity Act*.

Table 6-15 Priority weeds within the study area

Weed species	WoNS	Priority	Regional concern	Relevant biosecurity duty
Bridal creeper (*Asparagus asparagoides)*	✓	✓		**Prohibition on dealings.** Must not be imported into the state or sold.
Green Cestrum (*Cestrum parqui)*		✓	✓	**Regional Recommended Measure.** Land managers should mitigate introduction and/or spread. Should not be bought, sold, grown, carried, or released into the environment.
Pampas Grass (*Cortaderia selloana)*		✓	✓	**Regional Recommended Measure.** Land managers should mitigate introduction and/or spread. Should not be bought, sold, grown, carried, or released into the environment.
Lantana *(Lantana camara)*	✓	✓		**Prohibition on dealings.** Must not be imported into the state or sold.
African Olive *(Olea europaea subsp. Cuspidate)*		✓	✓	**Regional Recommended Measure.** Should not be traded, grown, carried, or released into the environment.
Blackberry *(Rubus fruticosus)*	✓	✓	✓	**Prohibition on dealings.** Must not be imported into the state or sold.

Threatened flora and fauna

Background searches identified 25 threatened flora species and 53 threatened fauna species recorded or predicted to occur within 5 km of the study area. Of these, 26 species were identified as having a moderate or higher likelihood of occurrence in the study area.

An individual, White- Bellied Sea-Eagle (*Haliaeetus leucogaster*) and two Cumberland Plain Land Snails (*Pteropus poliocephalus*) were observed within the study area during field investigations. No White-bellied Sea-Eagle nests or suitable nesting trees were identified and it is likely this species was only traversing the area. The Cumberland Plain Land Snail is known to occur in the surrounds of Prospect Reservoir and there are numerous previous records of the species within the study area.

No threatened flora were identified within the study area during field surveys.

No threatened aquatic species habitat is mapped within the study area (DPI, 2022) and there are no threatened aquatic species recorded within 5 km of the study area. No threatened aquatic species were detected during field investigations.

Terrestrial habitat

The woodland vegetation (PCT 3320 and PCT 4023) and hollow bearing trees within the study area may provide general foraging and roosting habitat for native fauna including woodland birds, microbats and Grey-headed Flying fox. Leaf litter and understorey vegetation provides foraging and breeding habitat for the Cumberland Plain Land Snail. Areas of exotic grassland within the study area provides marginal foraging habitat for woodland birds.

Aquatic habitat

Prospect Reservoir provides aquatic habitat within the study area and is mapped as KFH. As Prospect Reservoir is a man-made waterbody across a natural waterway (Prospect Creek), it is considered moderately sensitive fish habitat. It is a closed system with no fish passage upstream or downstream of the reservoir, except in very rare circumstances.

A visual assessment of the reservoir within the study area was completed, however the depth of the water hindered the ability to determine the substrate composition. Minor amounts of algae were identified on instream surfaces along the edges of the reservoir, and aquatic vegetation consistent with the BC Act listed Sydney Freshwater Wetland TEC is present. The water was mostly clear, having a relatively low level of turbidity. This habitat is likely to be suitable for non-threatened aquatic and amphibious fauna.

Macrophytes and algae

A recent (2022) macrophyte survey by WaterNSW identified extensive macrophyte and charophyte beds across the littoral zone of Prospect Reservoir. Charophytes are benthic, submerged, multicellular macroalga, which have a plant-like appearance. The species of macrophyte identified include:

- Ribbon weed (*Vallisineria americana*)
- Clasp pondweed (*Potamogeton perfoliatus*)
- Hydrilla (*Hydrilla verticillate*)
- Waternymph (*Najas tenuifolia*).

The species of charophytes identified include Chara and Nitella.

Light availability usually limits macrophyte and algal growth in deep water. The high dissolved oxygen saturation in the reservoir (from bubble plume aeration) promotes submerged vegetation growth. Submerged macrophytes were observed down to 8 m, although, maximum growth was observed around 1-3 m deep.

Macroinvertebrates

A recent (2022) macroinvertebrate survey by Sydney Water identified the following taxa present within Prospect Reservoir:

- Freshwater shrimp (*Atyidae*)
- Riffle beetle (*Elmidae*)
- Fly larvae – non biting midge (*Chironomidae*)
- Caddis Fly Larvae (*Leptoceridae*)
- Oligochaeta worm (*Naididae*).

Fish

A total of nine native and three invasive fish have been recorded in Prospect Reservoir during surveys in 2004, 2020 and 2022 (Table 6-16). The Murray cod (threatened species) present in the reservoir are thought to be a translocated population from Lake Burragorang since Prospect Reservoir is not within their natural range.

Table 6-16 Prospect Reservoir fish species

Fish species	Conservation status
Australian Bass (*Percalates novemaculeata*)	Common
Freshwater catfish (*Tandanus tandanus*)	Common (outside Murray-Darling Basin)
Murray Cod (*Tandanus tandanus*)	Vulnerable (EPBC Act) – outside of historical range
Australian smelt (*Retropinna semoni*)	Common
Flat head Gudgeon (*Philypnodon grandiceps*)	Common
Dwarf Flat head Gudgeon (*Philypnodon macrostomus*)	Common
Carp gudgeon (*Hypseleotris sp*)	Common
Long-finned eel (*Anguilla reinhardtii*)	Common
Short-finned eel (*Anguilla australis*)	Common
Freshwater eel (*Anguilla spp*)	Common
Common carp (*Cyprinus carpio*)	Invasive
Oriental weatherloach (*Misgurnus anguillicaudatus*)	Invasive
Eastern mosquitofish (*Gambusia holbrooki*)	Invasive

Potential construction impacts

During construction, direct and indirect impacts to native vegetation and habitat will occur. Direct impacts to vegetation are summarised in Table 6-17 and shown in Figure 6-3. No-go zones will be established for vegetation within the study area that is not to be impacted.

Tests of Significance (ToS) have been undertaken for the three TECs impacted by the proposal. It was determined that the proposal is unlikely to have a significant impact on the TECs listed in Table 6-17 for the following reasons:

- Larger areas of higher quality vegetation will be retained in the broader locality.
- The impacts are localised to small, fragmented low-quality patches of TEC that have already been exposed to a number of disturbances.
- The proposed works will not significantly trigger or exacerbate any key threatening processes.
- The proposal is unlikely to significantly alter the extent, species assemblages or structural diversity of the TEC to the point where it becomes locally extinct.
- The removal of vegetation will not result in the isolation or fragmentation of habitat within the study area.

Figure 6-3 Vegetation impact area

Table 6-17 Direct impacts to vegetation

PCT	TEC (BC Act)	Description	Area of impact (ha)	Assessment of significance
3962	Endangered	Sydney Freshwater Wetlands	0.005	ToS have been undertaken to determine the significance of impacts to these TECs. Unlikely to be a significant impact.
3320	Endangered	Cumberland Plain Woodland	3.15	
4023	Critically endangered	Swamp Oak Floodplain Forest	0.03	
NA	NA	Urban native/exotic vegetation	0.46	NA
NA	NA	Exotic grasslands	9.53	NA

Impacts to threatened fauna

Vegetation clearing would result in the loss of habitat for threatened fauna considered to have a moderate or higher likelihood to occur in the study area. It will also result in the loss of feed trees for arboreal mammals and woodland birds.

ToS and Significant Impact Criteria (SIC) assessments have been undertaken for 17 threatened fauna species likely to be impacted by the proposal. It was determined that the proposal is unlikely to have a significant impact on the threatened fauna species listed in Table 6-18 for the following reasons:

- There are larger areas of higher quality, more suitable habitat in the immediate vicinity and broader locality.
- Most are bird or bat species that are highly mobile and able to traverse the landscape in search of suitable habitat resources.
- Habitat to be removed is not considered critical to these species' survival.
- A translocation plan for Cumberland Plain Land Snail will be implemented.
- The proposed works will not significantly trigger or exacerbate any Key Threatening Processes.

Table 6-18 Impacts to threatened fauna requiring ToS and SIC assessments

Fauna type	Fauna species	ToS	SIC	Habitat impacted
Woodland birds	Swift Parrot (*Lathamus discolor*)	✓	✓	Removal of 3.2ha of PCT 3320 and PCT 4023
	Dusky Woodswallow (*Artamus cyanopterus cyanopterus)*	✓		
	Little Eagle (*Hieraaetus morphnoides)*	✓		
	Little Lorikeet (*Glossopsitta pusilla*)	✓		
	Masked Owl (*Tyto novaehollandiae*)	✓		
	Powerful Owl (*Ninox strenua*)	✓		
	Square-tailed Kite (*Lophoictinia isura*)	✓		
	Turquoise Parrot (*Neophema pulchella*)	✓		
	Varied Sitella (*Daphoenositta chrysoptera*)	✓		
Microbats	Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*)	✓		Removal of 3.2ha of PCT 3320 and PCT 4023 including one hollow bearing tree
	Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)	✓		
	Greater Broad-nosed Bat (*Scoteanax rueppellii*)	✓		
	Large Bent-winged Bat (*Miniopterus schreibersii oceanensis*)	✓		
	Little Bent-winged Bat (*Miniopterus australis*)	✓		
	Southern Myotis (*Myotis macropus*)	✓		
Arboreal mammals	Grey-headed Flying Fox (*Pteropus poliocephalus*)	✓	✓	Removal of 3.15ha of PCT 3320
Snails	Cumberland Plain Land Snail (*Meridolum corneovirens*)	✓		Removal of 3.15ha of PCT 3320

Impacts to threatened flora

No threatened flora were identified within the study area and therefore no impacts are anticipated.

Removal of habitat resources

The proposed works will result in the removal of up to 3.2ha of native vegetation and one hollow bearing tree. This woodland habitat may provide general foraging and roosting habitat for native fauna including woodland birds, microbats and Grey-headed Flying fox. These species are highly mobile and may forage across the broader landscape including higher quality, intact native vegetation patches surrounding Prospect Reservoir.

Removal of leaf litter and understorey vegetation will also reduce foraging and breeding habitat for the Cumberland Plain Land Snail. Higher quality, more suitable habitat for Cumberland Plain Land Snail is available in the surrounding landscape.

The proposal would also remove exotic grassland, which provides foraging habitat for some common birds and mammals, as well as some shelter and foraging habitat for reptiles and frogs. Some of this area would only be impacted temporarily during construction.

Given the availability of other suitable hollow-bearing trees and habitat within the locality, and the vast amounts of foraging habitat within the adjacent Prospect Reservoir, the removal of the above habitat resources is not considered significant.

Aquatic habitats

Construction of the proposal would have minimal impact on natural aquatic habitat. Up to four stormwater drainage lines will be constructed along the bank of Prospect Reservoir. A small area of already modified shoreline along the edge of the reservoir would be impacted. A coffer dam would be installed around the construction zone. The area of potential habitat for fish and other aquatic species would be reduced by a negligible amount during construction.

Potential operational impacts

The proposal is not expected to result in any terrestrial biodiversity impacts during operation. The proposal has the potential to impact aquatic biota from discharge of pre-treated water to Prospect Reservoir.

A recent ecotoxicology assessment (GHD, 2022) was completed for a trial flocculant dosing in Prospect Reservoir. This assessment found doses of Ferric Chloride as high as 40mg/L posed a low risk of toxicity to aquatic biota, other than microalgae in Prospect Reservoir. Discharges associated with this proposal will contain a maximum of 3.5mg/L of Ferric Chloride which is significantly less than the 40 mg/L concentrations tested.

The cationic polymer (Praestol DW25) and anionic polymer (SNF Floquat 4526) used in the PPTP are commonly used in water treatment, are non hazardous substances and do not bioaccumulate. According to the safety data sheets, Praestol DW25 is toxic to aquatic biota (*Oncorhynchus mykiss and Arcartia tonsa*) at levels greater than 100mg/L and SNF Floquat 4526 is toxic to aquatic biota (*Danio rerior and Daphnia magna*) at 10-100mg/L. Discharges associated with this proposal will contain a maximum of 3.6mg/L of Praestol DW25 and 1mg/L of SNF Floquat 4526. These concentrations are significantly below the levels at which ecotoxicity is reported. Given the

infrequent nature and relatively small volume of the proposed discharges the proposal is unlikely to negatively impact the aquatic ecosystem.

Discharges to Prospect Reservoir would occur via an existing water channel designed to dissipate energy and to minimise disturbance to the bed of the reservoir. Discharge to Prospect Reservoir would be based on an operational protocol to be developed and agreed with WaterNSW.

Offsetting

Non-statutory requirements

Although formal offsets are not required under the BC Act, Sydney Water has an internal position to deliver a 'maintained or enhanced' biodiversity outcome if proposals have residual biodiversity impacts. Vegetation removed will be offset in accordance with Sydney Water's Biodiversity Offset Guide as outlined in the mitigation measures below. Table 6-19 summarises the potential offset requirements, based on the guide.

Table 6-19 Non-statutory biodiversity offset requirements

Vegetation community	Impact Area / Number of trees	Offset multiplier	Maximum Offset Requirement
PCT 3962	0.005 ha	2:1	0.01 ha
PCT 3320	3.15 ha	2:1*	6.30 ha
PCT 4023	0.03 ha	3:1	0.06 ha
Hollow bearing trees	1	2:1	2 nest boxes or salvaged hollows
Total			**6.37 ha**

*This offset multiplier has been reduced in consideration of the low condition, lack of understory in this PCT.

On site replanting and rehabilitation of the surrounding bushland is the preferred offset method. Figure 6-4 gives an indication of the landscaped areas within the PPTP site, including areas of replanting and habitat restoration (about 1.5 ha). Sydney Water land used for the main site compound to the north of the Gate 10 access road will also be replanted (about 3 ha). The remaining offset requirement will be met by rehabilitation and weeding of the surrounding bushland. Opportunities to rehabilitate (weed) bushland in the adjacent Prospect Nature Reserve may also be investigated.

Figure 6-4 Indicative landscaping and habitat restoration within PPTP site

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 6-20 Environmental mitigation measures — flora and fauna

Mitigation measures
Provided it is essential for delivering the project, Sydney Water's Project Manager can approve the following vegetation removal and tree trimming, without additional environmental assessment (but only after consultation with the Environmental and Community Representatives and affected landowners). Sydney Water considers vegetation removal in these circumstances has minimal environmental impact. • Any minor: - vegetation trimming or - removal of exotic vegetation or - removal of planted native vegetation where the vegetation is not a threatened species (including a characteristic species of a threatened community or population), heritage listed, in declared critical habitat or in a declared area of outstanding biodiversity value.

Mitigation measures
• Any removal of remnant vegetation where there is no net change to environmental impact (eg a different area of vegetation is removed but the total area is the same or less than assessed in the EIA). Written explanation of the application of this clause (including justification of the need for trimming or removal and any proposed revegetation) should be provided when seeking Project Manager approval. Any impacts to native vegetation and trees must be offset in accordance with the Biodiversity Offset Guideline (SWEMS0019.13).
Residual impacts to native vegetation and trees will be offset in accordance with the Biodiversity Offset Guideline (SWEMS0019.13).
Any native vegetation removed during construction would be restored according to the Sydney Water Guideline for Native Revegetation Following Construction (SWEMS0025.11).
Map and report native vegetation clearing greater than 0.01 ha in extent (and any associated rehabilitation) to the Sydney Water Environmental Representative. Track vegetation clearing as per SWEMS0015.26 Contractor Native Vegetation Clearing and Rehabilitation template.
Minimise vegetation clearance and disturbance, including impacts to standing dead trees and riparian zones. Where possible, limit clearing to trimming rather than the removal of whole plants.
Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing.
Protect trees in accordance with the requirements of Australian Standard 4970-2009 for the Protection of Trees on Development Sites. Do not damage tree roots unless absolutely necessary, and engage a qualified arborist where roots >50mm are impacted within the Tree Protection Zone.
Retain dead tree trunks, bush rock or logs in-situ unless they are in the study area and moving is unavoidable. Reposition material elsewhere on the site or approved adjacent sites. If native fauna is likely to be present, a licenced ecologist should inspect the removal and undertake fauna relocation.
Inspect vegetation for potential fauna prior to clearing or trimming. If fauna is present, or ecological assessment has determined high likelihood of native fauna presence, including removal of hollow bearing trees, engage WIRES or a licenced ecologist to inspect and relocate fauna before works.
If native fauna is encountered on site, stop work and allow the fauna to move away unharassed. Engage WIRES or a licenced ecologist if assistance is required to move fauna.
Avoid impeding/blocking fish passage. Retain snags and natural obstructions in waterways where possible.
If any threatened species (flora or fauna) is discovered during the works, stop work immediately and notify the Sydney Water Project Manager. Work will only recommence once the impact on the species has been assessed and appropriate control measures provided.

Mitigation measures
If any damage occurs to vegetation outside of the impact area (as shown in the CEMP), notify the Sydney Water Project Manager and Environmental Representative so that appropriate remediation strategies can be developed.
Manage priority weeds in accordance with the *Biosecurity Act 2015* (see NSW Weedwise) and record pesticides and herbicides use in accordance with SWEMS0017.
To prevent spread of weeds, wrap straw bales in geofabric to prevent seed spread.
If replanting near Sydney Water pipelines refer to '*Which trees can damage wastewater pipes?'* link from Sydney Water website to help identify suitable species.
In TOBAN period: • check specific TOBAN notice to confirm whether the work can be carried out under standard exemptions (Govt Gazette No18 Feb 2018) • if the work is not covered by a standard exemption, apply to RFS for specific exemption.
Consult Taronga Zoo's Ben Zerbes (Mobile: 0417 201 180, Email: bzerbes@zoo.nsw.gov.au) prior to the removal of any Forest Red Gums (*Eucalyptus tereticornis*) to determine the usefulness of vegetation waste as koala feed.
Consider the Developments Adjacent to NPWS Lands Guidelines (DPIE, 2020) for ancillary works immediately adjacent to Prospect Nature Reserve.
All hollow-bearing trees are to be removed in a two stage process: • Stage 1: All surrounding vegetation to be cleared and grubbed. • Stage 2: 24 to 48 hours later (or in accordance with approval documentation) the hollow-bearing trees are to be inspected by an ecologist. If resident fauna is observed, the hollow section is to be lowered to the ground and the animal allowed to move on of its own volition. If injured, the fauna to be taken to a WIRES carer or appropriate veterinarian for care.
Pre-clearance inspections for Cumberland Plain Land Snail are required prior to vegetation removal in PCT 3320. Any individuals identified during the pre-clearance inspections and construction must be relocated to adjacent retained habitats. The translocation plan provided in Appendix 5 must be followed.
All staff on site are to be educated on the ID characteristics of the threatened species in Table 6-18 and advised to not handle fauna species under any circumstances during toolbox talks.

6.2.4 Aboriginal heritage

An Aboriginal Heritage Due Diligence Assessment was completed by AECOM in October 2024. The findings of this assessment are summarised here and the complete report is provided in Appendix E. Aboriginal heritage items within the study area are shown in Figure 6-5.

Existing environment

The proposal is located in a high risk landscape for Aboriginal Heritage as it is within 200 m of a waterway. Visual inspection of the study area was conducted to identify the presence of Aboriginal heritage items, assess levels of disturbance and identify if Aboriginal objects are likely to occur beneath the ground surface.

The site inspections confirmed the study area has been extensively modified, with very few areas retaining potential for Aboriginal heritage. The landform (undulating slopes of varying degrees) was not considered archaeologically sensitive due to the gradient and distance to water. There were no surface expressions of artefacts or other site types. The potential for Aboriginal heritage to remain within the area was assessed as low.

A search of the Aboriginal Heritage Information Management System (AHIMS) was conducted on 15 May 2024 for registered AHIMS sites within the vicinity of the PPTP site. A total of 13 Aboriginal sites were identified (see Table 6-21). Of the 13 sites, one is within the study area (45-6-0867)

Redacted to protect sensitive Aboriginal heritage information

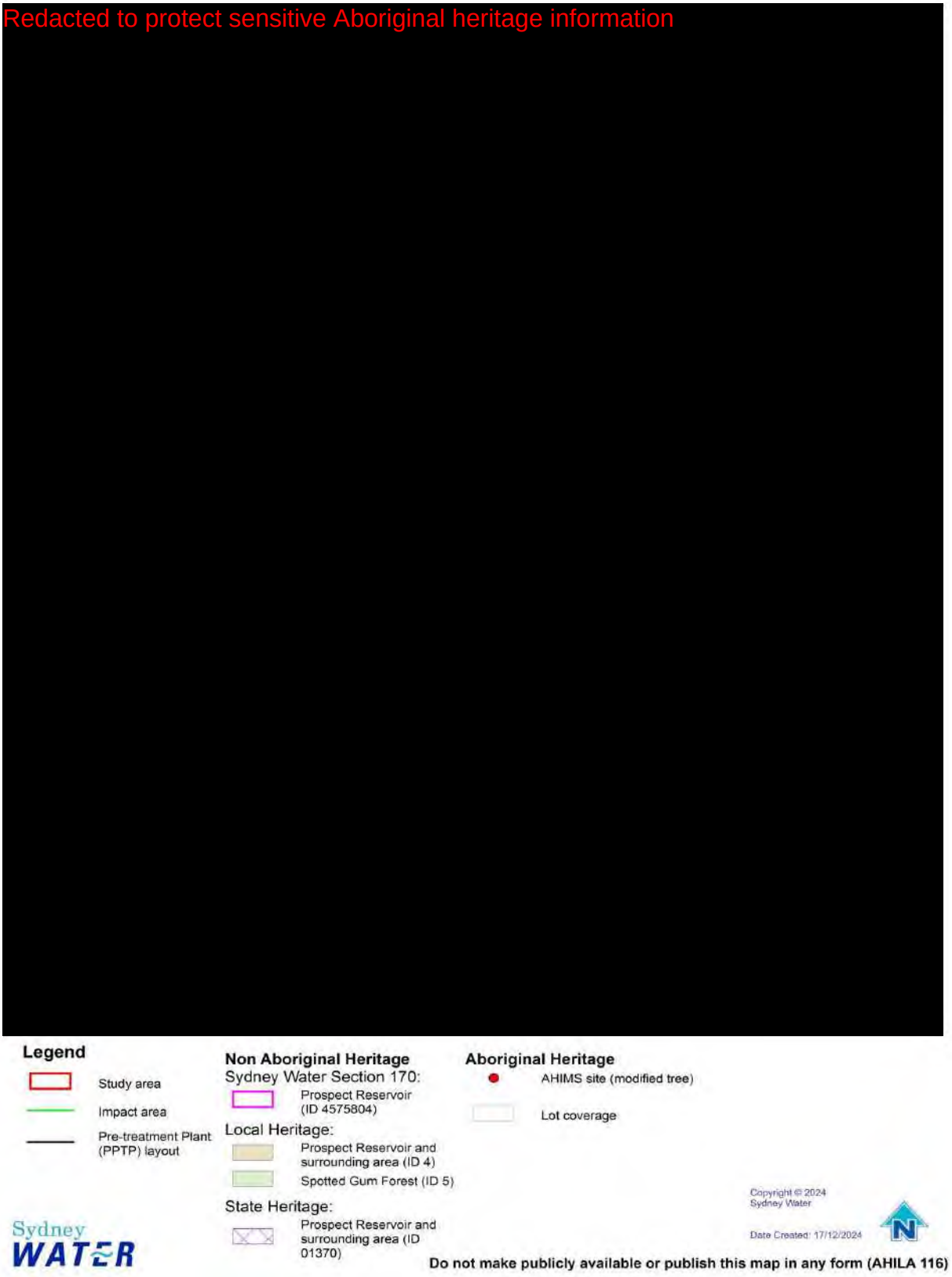

Figure 6-5 Heritage constraints

Potential impacts

Given the extensive disturbance to the natural ground surface caused by the construction and operation of Prospect Reservoir, it is concluded that the potential for Aboriginal objects to be present within the study area is low. There is little potential for harm to Aboriginal objects from the proposal. Works can proceed with caution.

It is unlikely the proposal would result in any operational impacts to Aboriginal heritage.

Mitigation measures

With the implementation of the mitigation measures below, impacts to Aboriginal Heritage can be adequately managed.

Table 6-22 Environmental mitigation measures —Aboriginal heritage

Mitigation measures
All site personnel must be inducted by a heritage specialist (or delegate) before starting work on site. The induction should include clear explanation of Aboriginal heritage constraints, measures to avoid impacts, stop work procedures, and contact details to obtain further Aboriginal heritage guidance if needed.
Do not make publicly available or publish, in any form, Aboriginal heritage information on sites / potential archaeological deposits, particularly regarding location.
Repeat the basic AHIMS search if it is older than 12 months. Conduct additional assessment if new sites are registered and could be impacted by the works.
If any Aboriginal object is found, cease all excavation or disturbance in the area and notify Sydney Water Project Manager in accordance with SWEMS0009.

Mitigation measures

[redacted]

6.2.5 Non-Aboriginal heritage

A Statement of Heritage Impact was completed by AECOM in October 2024. The findings of this assessment are summarised here and the complete report is provided in Appendix E. Non-Aboriginal heritage items within the study area are shown in Figure 6-5.

Existing environment

The proposal is located within the curtilage of the Prospect Reservoir and surrounding area item (ID 01370), which is listed on the New South Wales (NSW) State Heritage Register (SHR), Sydney Water Section 170 Heritage and Conservation Register (ID 457804) and the Precincts-Western Parkland City SEPP (ID 4) as an item of State significance.

The proposal is also located within the curtilage of the Spotted Gum Forest item (ID 5) which is listed on the Precincts – Western Parkland City SEPP as an item of local significance.

No other heritage items or elements have been identified within or in the vicinity of the study area.

Spotted Gum Forest

This item covers a large part of the study area. This items value relates to natural heritage, specifically the Spotted Gum Forest plant community type. This item was first listed as a regional heritage item, 'Forest of Spotted Gums' in the Fairfield LEP 1994. The Prospect Reservoir CMP describes the forest species across the study area as Spotted Gum in 1893. It is noted from historical aerial photography, that the existing vegetation has been cleared numerous times since then. No Spotted Gum Forest was identified within the study area during field investigations by a qualified ecologist.

Prospect Reservoir and surrounds

Prospect Reservoir is historically significant because it is a central element of Sydney's water supply system. The reservoir supplied water to Sydney for over 120 years, and generally still operates in the same way as it was originally constructed. The reservoir area is aesthetically significant, as a picturesque site with a large expanse of water, parklands, landscaping and bushland.

A Conservation Management Plan (CMP) was prepared for the Prospect Reservoir site by Sydney Water in 2005. The CMP sets out conservation policies and strategies regarding works that take place within the Prospect Reservoir site, as well as documenting its history and significance.

The CMP lists three sites of remaining historic archaeological importance:

- Prospect Reservoir

- Valve House
- Veteran Hall.

The reservoir itself is to the north of the proposed works, while the valve house and Veteran Hall are on the opposite shore of the reservoir to the north east. None of these areas are likely to be impacted. Non-Aboriginal archaeological potential within the study area is assessed as low.

The CMP contains a schedule of significant elements across the site. The study area is in the Inlet Precint. The significant elements in the Inlet Precinct relate almost exclusively to the Upper Canal and are located well outside the study area.

Potential impacts

Spotted Gum Forest

As noted above, the locally significant Spotted Gum Forest is partly located within the study area. It is noted from historical aerials that the vegetation across the study area has been cleared and replanted numerous times in the reservoir's history, most recently in the early 2000's after this item was listed. No Spotted Gum Forest was identified in the study area during field investigations by a qualified ecologist. Removal of replanted vegetation to construct the PPTP will therefore have a minor/inconsequential impact to this local heritage item.

Prospect Reservoir and surrounds

No significant heritage elements will be impacted by the proposal. Items affected by the proposal are modern structures with little to no heritage significance. The study area has been significantly disturbed with modern development and there is little potential for unidentified archaeology or heritage items to remain. By confining works to the study area, impact to the heritage significance of Prospect Reservoir will be minimal.

Visual impacts

The proposal would result in some visual impact on adjacent heritage elements forming part of the wider State heritage listing. Visual impacts on the Inlet Precinct of the Prospect Reservoir and Surrounding Area item (ID 01370) will occur with the introduction of new water treatment infrastructure. As this infrastructure is considered to be consistent with the nature of existing infrastructure and will not visually dominate the heritage item these impacts are considered minimal.

Overall statement of heritage impact

Overall, the study area has been significantly disturbed with modern development and there is little potential for unidentified archaeology or heritage to remain. As no existing heritage values will be impacted and as the proposal is consistent with the reservoir's purpose as part of the water supply infrastructure of Sydney, it is concluded that the overall impact of the proposal is minor and will not materially affect the State heritage significance of Prospect Reservoir and Surrounding Area (SHR

01370). A s60 permit is required for works within the SHR listed Prospect Reservoir and surrounding area.

Mitigation measures

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

Table 6-23 Environmental mitigation measures — non-Aboriginal heritage

Mitigation measures
A photographic record must be taken prior to alterations and throughout the construction process, to document changes. The photographic record must be forwarded to Sydney Water's Heritage Advisor.
If any non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify Sydney Water Project Manager in accordance with SWEMS0009.
All site personnel must be inducted by a heritage specialist (or delegate) before starting work on site. The induction should include clear explanation of heritage constraints, go and no-go areas, processes and measures to avoid impacts, stop work procedures, and contact details to obtain further heritage guidance if needed.
A section 60 application will be obtained prior to construction. Any additional conditions of consent must be complied with.

6.2.6 Noise and vibration

A Noise and Vibration Assessment was completed by GHD in 2023 as part of the reference design. The findings of this assessment are summarised here and the complete report is provided in Appendix I.

Existing environment

Prospect Reservoir is largely surrounded by a range of industrial businesses/warehouses, Prospect Nature Reserve, Andrew Campbell Reserve, nearby arterial roads and the M4 Motorway. The closest residential receivers are about 800 m southwest. The existing pilot plant within the study area was not considered a receiver as it’s occupied infrequently with no permanent staff.

Construction noise criteria

Noise monitoring was conducted at the two closest residential receivers (see Figure 6-7):

- Monitoring location 1 (M1) at 121-135 Chandos Rd, Horsley Park
- Monitoring location 2 (M2) at 158 Ferrers Rd, Horsley Park.

The background noise environment was similar at both monitoring locations, with both affected by road traffic noise, occasional industrial noise and natural sounds such as birds and wind. Background noise levels (RBL) from each location are listed in Table 6-24.

Construction noise management levels (NML) for residential receivers were derived from the RBL at M2 + 10dB(A) for standard daytime hours, as per the Draft Construction Noise Guideline (EPA, 2020b). NMLs for outside recommended standard hours were derived from the RBL + 5dB(A). A level of 75dB(A) represents a 'highly noise affected' receiver.

Construction NMLs for non-residential receivers are provided in the Draft Construction Noise Guideline (EPA, 2020b) and are also shown in Table 6-24.

Table 6-24 Background Noise Levels (RBL) and Construction Noise Management Levels (NML)

Area	Period	RBL L_{A90} dB(A)	Construction NML	
			Standard hours $L_{Aeq(15min)}$	Outside standard hours $L_{Aeq(15min)}$
M1 (residential receiver)	Day	42	53	48
	Evening	42	-	47
	Night	38	-	41
M2 (residential receiver)	Day	43	53	48
	Evening	42	-	47
	Night	36	-	41
Industrial premises	For non - residential receivers NML applies when properties are in use		75	
Educational institute			55	
Place of worship			55	
Passive recreation area			60	
Active recreation area			65	

Noise compliance criteria for construction traffic was adopted in accordance with the Road Noise Policy (RNP) (DECCW, 2011). If road traffic noise during construction increases within 2 dBA of current levels, then the objectives of the RNP are met and no specific mitigation measures are required.

Operation noise criteria

Operational noise trigger levels for the proposal were derived as the lower of the intrusive and amenity criteria following the *Noise Policy for Industry* (NPI) (EPA, 2017) and are provided in Table 6-25. These apply to environmental noise emissions during operation of the PPTP.

Table 6-25 Project noise trigger levels (PNTL)

Area	Period	PNTL $L_{Aeq(15min)}$ dB(A)
Rural residential receiver	Day	48
	Evening	43
	Night	38
Industrial premises	When in use	68
Educational institute	Noisiest 1-hour period when in use	43
Place of worship	When in use	48
Passive recreation areas	When in use	48
Active recreation areas	When in use	53

The RNP also provides criteria for operational traffic noise. If road traffic noise during operation increases within 2 dBA of current levels, then the objectives of the RNP are met and no specific mitigation measures are required.

Potential impacts

Construction noise

An assessment of potential construction noise impacts has been undertaken during standards hours as well as out of hours work (OOHW) on Saturday (1pm – 5pm). Predicted construction noise levels are conservative and have assumed all construction machinery will be operated simultaneously.

Construction noise levels are predicted to exceed the standard hours NMLs (by up to 2dB) during sheet piling works at six residential receivers. No receivers will be highly noise affected. Noise levels from all other construction activities are precited to be below the NMLs during standard hours. No impacts are predicted at any non-residential receivers.

No construction works are proposed during the night and as such, no sleep disturbance impacts are anticipated.

A small number of receivers are predicted to exceed the NMLs (up to 5 dB) during OOHW on Saturday. The use of high noise generating equipment including chainsaws, concrete saws, woodchippers, compactors and vibrators should be limited during OOHW.

Construction traffic noise along Ferrers Road and Horsley Drive is predicted to be less than 2 dB and will not exceed the RNP criteria. No impacts to residents along these routes are anticipated.

Construction vibration

Vibration intensive construction work may include the use of piling rigs, vibratory rollers, excavators and jackhammers. Table 6-26 outlines the minimum working distances which could result in either cosmetic damage or human response from vibration. No sensitive receivers have been identified within the safe working distances for vibratory intensive work. No adverse (structural damage or human comfort) vibration impacts are anticipated.

The nearest sensitive receivers are approximately 800 m from the PPTP. Due to this large separation distance, vibration impacts during operation are not anticipated and no further assessment is warranted.

Table 6-26 Vibration safe working distances

Equipment	Rating/description	Human comfort (m)	Cosmetic damage (m)
Piling rig	Bored <800 mm	N/A	2 (nominal)
	Hammer (12 t down force)	50	15
	Vibratory (sheet piles)	20	2-20
Vibratory roller	>18 t	100	25
	13-18 t	100	20
	7-13 t	100	15
	4-6 t	40	12
	2-4 t	20	6
	1-2 t	15	5
Small hydraulic hammer	300 kg (5-12 t excavator)	7	2
Medium hydraulic hammer	900 kg (12-18 t excavator)	23	7
Large hydraulic hammer	1600 kg (18-34 t excavator)	73	22

Equipment	Rating/description	Human comfort (m)	Cosmetic damage (m)
Jackhammer	Handheld	Avoid contact with structure	1 (nominal)

Operational noise

During operation, the PPTP may be run continuously for periods or be placed into one of the standby modes. The frequency of operation will largely depend on the raw water quality from Warragamba Dam and drinking water demand. For the purpose of the noise assessment, 24/7 operation has been assumed with the majority of noise sources operating consistently throughout the day, evening and night periods.

Modelled results show that operational noise levels are not expected to exceed the PNTLs at any sensitive receivers. The sensitive receiver at 158-170 Ferrers Road is predicted to experience the highest noise level of $L_{Aeq(15\ min)}$ 35 dBA. All other receivers are predicted to experience noise levels below this.

The results indicate that the dominant noise source is from the inlet channel, followed by noise from the ballasted sedimentation tank and the residuals handling building.

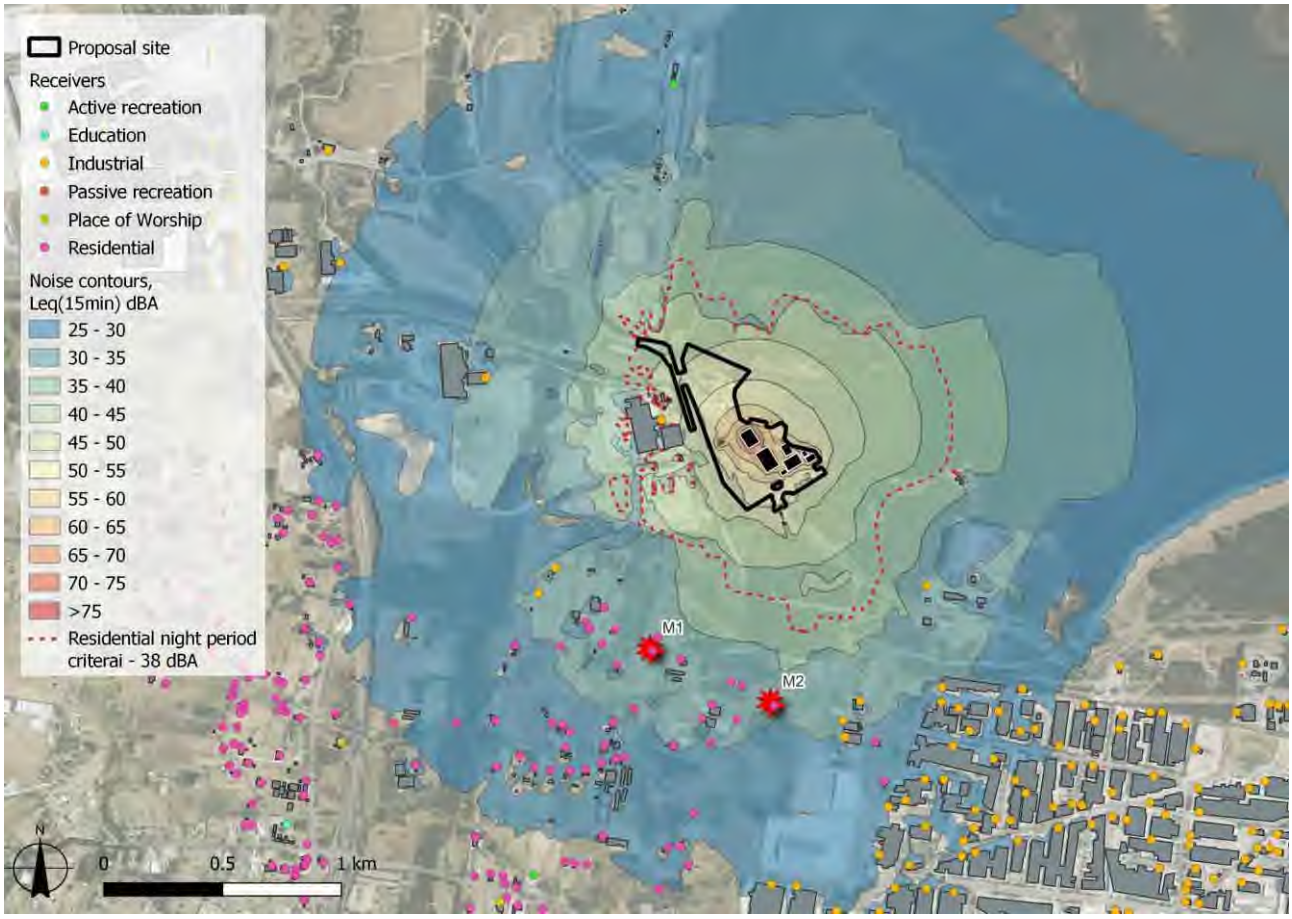

Figure 6-7 Operational noise contours

Mitigation measures

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

Table 6-27 Environmental mitigation measures — noise and vibration

Mitigation measures
Works must comply with the EPA Construction Noise Guideline (Draft, 2020), including scheduling work and deliveries during standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturday. No work to be scheduled on Sunday nights or public holidays. Any proposed work outside of these hours must be justified. The proposal will also be carried out in accordance with: • Sydney Water's Noise Management Procedure SWEMS0056 • Noise Policy for Industry (EPA, 2017). All reasonable and feasible noise mitigation measures should be justified, documented and implemented on-site to mitigate noise impacts.

Mitigation measures

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

- identify and consult with the potentially affected residents prior to the commencement:
  - describe the nature of works; the expected noise impacts; approved hours of work; duration, complaints handling and contact details.
  - determine need for, and appropriate timing of respite periods (e.g. times identified by the community that are less sensitive to noise such as mid-morning or mid-afternoon for works near residences)
- implement a noise complaint handling procedure
- plant or machinery will not be permitted to warm-up near residential dwellings before the nominated working hours.
- appropriate plant will be selected for each task, to minimise the noise impact (e.g. all stationary and mobile plant will be fitted with residential type silencers)
- engine brakes will not be used when entering or leaving the work site(s) or within work areas.
- regularly inspect and maintain equipment in good working order
- arrange work sites where possible to minimise noise (e.g. generators away from sensitive receivers, site set up to minimise use of vehicle reversing alarms, site amenities and/ or entrances away from noise sensitive receivers).
- use natural landforms/ mounds or site sheds as noise barriers
- schedule noisy activities around times of surrounding high background noise (local road traffic or when other noise sources are active).

As works beyond standard daytime hours are needed, the delivery contractor would:

- consider potential noise impacts and: implement the relevant standard daytime hours safeguards; Sydney Water's Noise Management Code of Behaviour (SWEMS0056.01) and document all reasonable and feasible management measures to be implemented
- identify additional community notification requirements and outcomes of targeted community consultation
- seek approval from the Sydney Water Project Manager in consultation with the environment and communications representatives.

If night works are needed, the delivery contractor would:

- justify the need for night works
- consider potential noise impacts and implement the relevant standard daytime and out of hours safeguards and document consideration of all reasonable and feasible management measures
- identify community notification requirements (i.e. for scheduled night work (not emergency works)),

Mitigation measures

- notify all potentially impacted residents and sensitive noise receivers not less than one week prior to commencing night work
- seek approval from the Sydney Water Project Manager in consultation with the environment and communications representatives.

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

- justify why all other times are not feasible
- consider potential noise impacts and implement relevant standard daytime, out of hours and night-time safeguards and other reasonable and feasible management measures
- identify community notification requirements

seek approval from the Sydney Water Project Manager in consultation with the environment and communications representatives.

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

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

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

An operational noise management plan (NMP) is required and should include the mitigation measures listed in Table 7.2 of Appendix F.

Inductions for the construction work crew should include the specific noise issues and mitigation measures required for the site. The induction would include:

- all noise and vibration mitigation measures
- relevant licence and approval conditions
- permissible hours of work
- any limitations on high noise generating activities
- location of nearest sensitive receivers
- construction employee parking areas
- designated loading/unloading areas and procedures
- site opening/closing times (including deliveries)
- environmental incident procedures.

6.2.7 Air and energy

Existing environment

The proposal is in an industrial area. The nearest receiver is an industrial business (Austral Bricks) located about 300 m east of site. The nearest residential properties are located 800 m southwest of the site. There are no sensitive receivers (schools, day care centres etc) within 2.5km.

A search of the National Pollutant Inventory identified no sources of pollutant within the study area. The closest source of pollutant is from Austral Bricks. The main source of air pollutants within the study area are emissions from motor vehicles from the road network.

Potential air impacts

The proposal will potentially result in dust/ air pollution from:

- dust generated during general construction and excavation
- dust generated by construction vehicles travelling on roads and tracks
- emissions from construction machinery, equipment and vehicles.

Impacts on air quality are expected to be temporary and would be minimised by implementing the safeguards shown in Table 6-29. There would be no operational impacts on air quality as a result of the proposal.

Potential energy impacts

Sydney Water has made a commitment to achieve net zero carbon emissions for their own operations by 2030, and across their supply chain by 2040. Sydney Water has also developed a Circular Economy Framework which includes four focus areas – water, nature, materials and energy and carbon. The principles from this circular economy framework include:

- design out waste and pollution
- keep resources in use at their highest value
- restore and regenerate natural systems.

A set of sustainability principles were developed for the proposal which align with Sydney Water's Circular Economy Framework. These measures need to provide value-for-money and a net benefit for the community and the environment. The delivery contractor will develop a Sustainability Management Plan (SMP) to document the sustainability initiatives to be adopted during design, construction and operation of the PPTP including:

- use of low embodied carbon materials and green concrete
- green house gas estimator
- implement renewable energy sources
- demolition waste re-use

- recycle office waste
- spoil re-use
- biodiversity and nature positive considerations.

Operation of the PPTP will consume energy. The installation of solar energy will be investigated during detailed design to offset the proposals energy consumption.

Energy savings were achieved during the reference design by selecting a smaller raw water pump system and optimising the dewatering system (to minimise trucking of waste). Impacts to the existing mini hydro at the Horsley Road outlet works have also been avoided, maximising the potential to generate green energy and reduce the net energy consumption of the proposal as a whole.

The Sydney Water Greenhouse Gas Estimator tool was used to develop a carbon footprint for the PPTP. Two scenarios were considered when calculating total emissions:

- Scenario 1 assumes the PPTP is operational 365 days a year.
- Scenario 2 assumes the PPTP is operational on average 86 days a year.

The total carbon footprint and likely emissions for each scenario is shown in Table 6-28. Opportunities to reduce the baseline carbon footprint will be sought as part of the SMP.

Table 6-28 PPTP carbon footprint

Emissions sources	Baseline emissions (tCO2e)	
	Scenario 1	Scenario 2
Embodied in construction materials	16,420	16,420
Embodied in chemicals	303,348	40,503
Transport of construction materials and waste	209	209
Transport of biosolids and chemicals	9,957	1,344
Vegetation clearing during construction	1,574	1,574
Energy use during construction	1,768	1,768
Grid electricity use during operation	33,293	1,825
Total	**366,569**	**63,643**

Mitigation measures

Table 6-29 Environmental mitigation measures — air and energy

Mitigation measures
Use alternatives to fossil fuels where practical and cost-effective.
Track energy use as per SWEMS0015.28 Contractor NGER template.
Maintain equipment in good working order, comply with the clean air regulations of the *Protection of the Environment Operations Act 1997*, have appropriate exhaust pollution controls, and meet Australian Standards for exhaust emissions.
Switch off vehicles/machinery when not in use.
Implement measures to prevent offsite dust impacts, for example: • water exposed areas (using non-potable water source where possible such as water from excavation pits) • cover exposed areas with tarpaulins or geotextile fabric • modify or cease work in windy conditions • modify site layout (place stockpiles away from sensitive receivers) • vegetate exposed areas using appropriate seeding.
Cover all transported waste.
Apply the project sustainability principles during detailed design, construction, operation and procurement where possible. Prepare a Sustainability Management Plan to outline how sustainability requirements will be met during the design, construction and operation of the proposal.

6.2.8 Waste and hazardous materials

Existing environment

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.

Potential impacts

Construction

Construction activities will generate the following waste streams:

- general construction and demolition waste including excavated road material
- excess spoil from excavation and earthworks

- green waste from vegetation removal
- groundwater dewatered from excavations
- general domestic waste from the construction work force such as food scraps, aluminium cans, glass bottles, plastic and paper containers and putrescible waste
- wastewater and grey water from temporary amenities.

The largest volume of waste generated by construction would be excess spoil from excavations. Spoil would be re-used on site for backfilling, landscaping and other uses, where possible. If spoil is unable to be re-used on site, opportunities for off-site re-use would be investigated.

If re-use opportunities are unable to be identified, or the spoil is unsuitable for re-use due to its geotechnical or contamination characteristics, spoil would be tested and classified according to the Waste Classification Guidelines (EPA, 2014) and disposed of at an appropriately licensed facility. A preliminary waste classification found that excavated spoil (typically fill materials and underlying natural soils) will meet the General Solid Waste (non-putrescible) classification.

General workforce waste including food packaging will be generated in minor quantities and will be classified as putrescible or non-putrescible general solid waste. Wastewater and grey water will be classified as liquid waste and be contained to temporary amenities prior to disposal. Significant volumes of liquid wastes, including oils or fuels are unlikely to be generated during construction.

A Hazardous Building Materials (HBM) assessment (GHD, 2023c) was completed for existing structures within the study area that require demolition. The HBMs identified are listed in Table 6-30.

Table 6-30 HBM identified in existing structures

Structure	HBM
Fluoride powder shed and store	• asbestos containing material (ACM) in electrical board, gaskets and debris on ground • dust on shed floor containing heavy metals • PCBs in fluorescent light fittings and switchboards • synthetic mineral fibres in roof sarking and debris on ground.
Aluminium sulfate tanks	• lead based paint on pipework • synthetic mineral fibres in fibre glass tanks and pipe insulation.
Fluoride tanks	• lead based paint on pumps.

Construction of the proposal may involve the transportation of asbestos and other hazardous waste. Waste may need to be tracked using the EPAs WasteLocate online tracking System.

Opportunities to reduce, recycle and reuse on this project would be sought with the delivery contractor and documented in the CEMP.

Operation

In addition to the waste produced during construction , operation of the PPTP will also generate waste streams including:

- dewatered sludge
- screenings (leaves, debris, fish and other animals removed from raw water)
- office waste such as paper, cardboard and plastic
- food waste from operational workforce
- liquid waste (wastewater, grey water and stormwater)
- maintenance supplies such as light bulbs and materials for equipment maintenance.

The largest volume of operational waste generated consists of dewatered cake from the sludge treatment process. Two thickened sludge storage tanks will provide five days of emergency sludge storage to manage disruptions to the truck out-loading process.

The cake may be beneficially reused under the existing resource recovery exemption (RRE) for lime and gypsum residues from drinking water treatment (EPA, 2006) if it meets the requirements listed. A period of testing and validation and a written statement of compliance would be required prior to any application to land. If the material does not comply with the relevant chemical characterisation and conditions of this existing RRE, an application for a specific resource recovery order (RRO) and RRE would be made to the EPA based on the actual quality of the material.

A typical constraint to beneficial reuse of water treatment residuals is its lack of nutrient (major constituents of the dewatered cake will be ferric hydroxide from precipitation of ferric chloride used in the treatment process, original suspended solids in the raw water that have been removed, and ballast material that is lost from the process). Reuse can also be complicated by the presence of algae (if in large amount) and poly aluminium chloride (if used) in the dewatered cake. A possible reuse option to consider is to blend the water treatment residuals into Sydney Water's existing biosolids product that is currently being reused. The proportion that can be blended without affecting the benefit of the biosolids product will need to be determined.

If reuse opportunities are unable to be identified the cake would be tested and classified according to the Waste Classification Guidelines (EPA, 2014) prior to disposal at an appropriately licensed facility.

Sources of contamination during operation of the PPTP include:

- lime and chemical storage and dosing systems
- electrical transformers potential housing PCBs
- other hazardous building materials contained within new structures.

During operation there will be potential exposure to chemicals, which are used and stored on site as part of the treatment process. If accidental release/spills of these chemicals occur they could come into contact with operational workers or migrate into the environment. Potential contamination events would be minimised by implementing the mitigation measures in Table 6-31.

Mitigation measures

With the implementation of the mitigation measures below, waste and hazardous building materials can be adequately managed and would not have a significant impact on the environment or human health. The contractor will seek opportunities to reduce, recycle and reuse materials. This will be documented in the Waste Management Plan or CEMP.

Table 6-31 Environmental mitigation measures — waste and hazardous materials

Mitigation measures
Prepare a Waste and Resource Recovery Plan (WRRP) to appropriately manage and classify any materials including soils, construction/demolition wastes and associated stockpiles The plan will be prepared by the delivery contractor (or nominated environmental consultant) and approved by the Sydney Water Project Manager in consultation with the Environmental Representative and Contamination and Hazardous Materials team. The WRRP should include: • expected waste types and their location • delineation of waste /resource types including identification of likely vertical and lateral extents (where warranted) • visual monitoring of materials during excavation and measures to be undertaken to prevent co-mingling / cross-contamination of waste / resource types • ex-situ waste and resource recovery classification program, including timing relative to project / excavation phases as well as proposed hold points • waste minimisation and resource recovery methodologies (including consideration of onsite reuse or management if contaminated) • roles and responsibilities in relation to stockpile and material management and monitoring program • proposed onsite reuse locations and reuse methodology (if applicable) • proposed offsite reuse, offsite recycling and / or offsite disposal locations / facilities • legislative compliance requirements • consideration of future maintenance • restoration.
Manage waste in accordance with relevant legislation and maintain records to show compliance e.g. waste register, transport and disposal records. Record and submit SWEMS0015.27 Contractor Waste Report.

Mitigation measures
Provide adequate bins for general waste, hazardous waste and recyclable materials.
Minimise stockpile size and ensure delineation between different stockpiled materials.
Minimise the generation of waste and sort waste streams to maximise reuse/recycling in accordance with the legislative requirements.
Manage waste and excess spoil in accordance with the NSW EPA Resource Recovery Orders and Exemptions (if applicable) and/or Waste Classification Guidelines. Where materials are not suitable or cannot be reused onsite or offsite, recycle where appropriate. Recycle soils at a licensed soil recycling facility or dispose at an appropriately licenced landfill facility.
Prevent pollutants from escaping including covering skip bins.
Dispose excess vegetation (non-weed) that cannot be used for site stabilisation at an appropriate green waste disposal facility.
If fibro or other asbestos containing material is identified, restrict access and follow Sydney Water's Asbestos Management – Minor Works procedure, Document Number 746607 and SafeWork NSW requirements. Contact Sydney Water Project Manager (who will consult with the Contamination and Hazardous Materials team).
Manage lead paint in accordance with the WHS Regulation (2017) Part 7.2 and the Australian Standard Lead Paint Management Guidelines. Consult with the Contamination and Hazardous Materials team where works involve removal of lead-based paint. Develop a Lead Management plan if required.
Review existing hazardous building materials (HBM) report and implement relevant safeguards. Conduct hazardous materials survey prior to commencement where works could impact hazardous materials not surveyed in previous HBM assessments.
Ensure that detailed design includes measures to minimise excess waste generation. Include a focus on optimising earthworks design to minimise excess spoil volumes and maximise the reuse of material on site.
Undertake sampling and testing to validate the chemical properties of the dewatered sludge to confirm if the material meets the current RRE for lime and gypsum residues from drinking water treatment (NSW EPA, 2006). Otherwise, prepare an application for a specific RRO and RRE to enable the dewatered sludge to be reused. Seek to establish agreements for the disposal (and beneficial reuse) of the dewatered sludge.

6.2.9 Traffic and access

A Traffic Impact Assessment was completed by GHD in 2023 as part of the reference design. The findings of this assessment are summarised here and the complete report is provided in Appendix G.

Existing environment

The proposal site is fenced and is not publicly accessible. Primary access for both light and heavy vehicles is via Gate 10 along Ferrers Road, which has a speed limit of 60 km/h. Ferrers Road is a regional road with one lane in each direction. The existing internal road network is a combination of sealed and gravel roads.

The nearest key freight routes to the proposal site include the Western Motorway, Westlink M7, Ferrers Road, Cowpasture Road and Victoria Street.

Local traffic volume

Traffic surveys were undertaken at 5 intersections to determine the local traffic volume in proximity to the study area. Turning movement counts were collected between 6-9 am and 3-6 pm to capture typical peak traffic periods.

Intersection counts were conducted at the following locations:

- Site 1 - Ferrers Road and Horsley Park Access Road (Gate 10) intersection
- Site 2 – Chandos Road and Ferrers Road roundabout
- Site 3 - Ferrers Road and Horsley Drive signalised intersection
- Site 4 - Cowpasture Road and Trivet Street intersection
- Site 5 - Cowpasture Road and Victoria Street roundabout.

The highest traffic volumes occur during weekday peak hour between 7:15-8:15 am and 4-5 pm.

Public and active transport

There are minimal public transport services close to the study area. The nearest train station is Fairfield Station, about 9.7 km from Gate 10. The nearest bus stop is about 1.5 km from Gate 10.

Active transport facilities near the study area are limited to shared paths south of Prospect Reservoir and along the water canal. There are currently no dedicated footpaths or cycling lanes that provide direct access to the site. Cycling is generally allowed along road shoulders on Ferrers Road and Chandos Road.

Potential impacts - construction

Construction traffic volume

Heavy vehicle movements to and from site are expected to peak during removal of spoil or concrete pours. During peak periods, up to 60 heavy vehicles are expected to access the site per day (120 vehicle movements). Outside of the peak construction period, this would reduce to about 30 trucks per day (60 vehicle movements).

Light vehicles are expected to peak at 200 vehicles per day (400 vehicle movements). Workers will generally access the site early in the morning and exit late in the afternoon, while heavy vehicles will access/egress the site over the course of the day.

Additional construction traffic is expected to pass through the site during upgrade works at the WaterNSW Prospect Reservoir Pumping Station. These works are expected to occur between March 2025 to September 2026. During peak periods, up to 10 heavy vehicles are expected to pass through the site per day (20 vehicle movement). Additional daily traffic traversing the site would include earth moving machinery, concrete trucks and pumps, cranage and general construction vehicles.

The proposed vehicle access routes to the proposal site are shown in Figure 6-8.

Figure 6-8 Proposed vehicle access routes

Intersection performance

The proposals impact on the road network was assessed by comparing traffic volumes and intersection performance with and without the additional construction traffic generated by the proposal. Construction traffic volumes were used as a worst case as they are expected to be significantly higher than operational traffic volumes.

Without construction, natural traffic growth in the area during 2024 is expected to cause a slight increase in intersection delays, with delays ranging between 0 and 17 seconds.

Construction of the PPTP is expected to have minimal impact on traffic and intersection performance. The five intersections studied will still operate efficiently with acceptable levels of service during peak times. Delays at these intersections range from 3 – 17 seconds, similar to the scenario without construction.

The main access point to the site (Site 1), will see the highest increase in delay due to its low baseline traffic volumes. Delays here will increase by up to 2.4 seconds during peak times.

Overall, the increase in traffic delays is considered negligible and the intersections will continue to operate with plenty of spare capacity.

Public and active transport

Impacts to public transport facilities and services are expected to be minimal, as the study area is not near any public transport facilities and will not interfere with existing public transport routes.

There is no formal active transport infrastructure in proximity to the site. Therefore, the expected vehicle activity associated with the construction and operation of the proposal will have a negligible impact on active transport.

Access

There will be a significant increase in the number of vehicles accessing the site during construction. To streamline vehicle access and avoid queuing on Ferrers Road, Gate 10 will be opened throughout the day (6 am to 6 pm) and boom gates will be installed for traffic control. The boom gates will be controlled by a security guard from a temporary security shed by the entrance.

A left in left out only policy will be implemented at Gate 10. Northbound motorists will use the existing roundabout at Brabham Road to change heading and enter site from the southbound lane. Motorists leaving the site to the north will use the existing roundabout at Chandos Road.

WaterNSW and potentially other third parties require ongoing access through the site to their assets via the existing bridge over Channel 7. This access will be maintained throughout construction.

Parking

Parking for all vehicles associated with the proposal will be contained to Sydney Water land. As such, vehicle parking demand generated by the proposal would have no impact on parking spaces or roads surrounding the site.

Other impacts to road users

Temporary traffic control may be required in some locations for heavy vehicle access to the site during peak construction. This could temporarily result in longer vehicle journey distances and increased travel times.

Haulage and delivery of materials and equipment will use existing approved heavy vehicle and oversize and/or overmass (OSOM) vehicle routes and are not expected to significantly change the vehicle composition on these roads. Should the delivery of materials and equipment require the use of OSOM vehicles, appropriate travel/access permits will be obtained for the sections of the road with travel conditions.

Potential impacts - operation

Traffic generation

The operation of the PPTP is expected to generate up to 22 heavy vehicles per day (44 vehicle movements). Light vehicle movements of staff going to and from the site is expected to peak at around 40 movements per day. This is a negligible increase in traffic and will not impact the road network or intersection performance.

Access

WaterNSW and potentially other third parties require ongoing access to their assets via the existing bridge over Channel 7. This access will be maintained via internal roads within the PPTP with appropriate security measures. The main access road through the site will be suitable for both vehicle and heavy machinery use.

Parking

On-site car parking will be provided and would ensure enough parking for all staff proposed on site. All parking will be contained within the study area.

Mitigation measures

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

The following mitigation measures focus on the management of construction traffic as the construction stage is expected to generate more vehicles than the operation of the PPTP. However, these measures may still be adopted (as applicable) during operation.

Table 6-32 Environmental mitigation measures — traffic and access

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

Mitigation measures
Erect signs to inform road users of the proposed works and any temporary road closures.
Ensure work vehicles do not obstruct vehicular or pedestrian traffic, or private driveway, public facility or business access unless necessary and only if appropriate notification has been provided.
All light vehicles shall be instructed to access the site from the north (left-in only) to minimise potential conflicts with heavy vehicles, and to minimise right-turn queueing along Ferrers Road.
All vehicle parking will be contained within the proposal site premises.
Key stakeholders, including owners/operators of adjacent lands and emergency service providers will be notified of any traffic management arrangements prior to the commencement of works.
A turnaround facility that can accommodate the largest vehicle entering the site shall be provided to allow all vehicles to exit the site in a forward direction, with vehicles to also enter in a forward direction.
A Road Dilapidation Report shall be prepared to provide documentation of road conditions prior to and following the completion of construction. The Road Dilapidation report shall: • include an assessment of existing road conditions (assessment generally undertaken via non-obstructive visual inspection). • describe mechanisms to prevent (as far as reasonably practicable) or rectify any damage that may result due to traffic and transport related to the proposal. The condition assessment is recommended for the following minor roads which are expected to be used for proposal transport but do not form part of the pre-approved heavy vehicle network, or currently have travel conditions for heavy vehicles: • Ferrers Road (south of site access) • Chandos Road • Peter Brock Drive.
Access for WaterNSW staff and their contractors to their assets will be maintained during construction and operation of the PPTP. This requirement must be documented in the TMP.

6.2.10 Social and visual

A Landscape Character and Visual Impact Assessment (LCVIA) was completed by GHD in 2023 as part of the reference design. The findings of this assessment are summarised below with the complete LVCIA provided in Appendix H.

Existing environment

The PPTP site is fenced and is not accessible to the public. Views of the PPTP site from major roads are obstructed by the natural landform and earth bunding east of Ferrers Road. Large areas of contiguous vegetation surrounding the reservoir provide visual separation to the north, south

and east. Planted vegetation also provides a visual buffer to Ferrers Road along the western boundary. George Maunder Lookout on the eastern side of Prospect Reservoir has views over the landscape, west towards the PPTP site.

Potential impacts

Construction of the PPTP would not be visible to members of the public or surrounding community. Potential social amenity impacts could occur in relation to noise and vibration and traffic and access. These aspects have been assessed separately in sections 6.2.7 and 6.2.10, respectively.

The proposal will require new permanent above ground structures which will alter the visual character of the environment over the long term. A photomontage of these above ground structures is provided in Figure 6-9.

Figure 6-9 Photomontage of the PPTP site

Viewpoints

Five viewpoints (see Figure 6-10) were selected as representative views of the study area from sensitive receivers in surrounding public areas. These include:

- VP1 – view south east towards Gate 10 entry from Ferrers Road
- VP2 – view north east from Ferrers Road
- VP3 – view west from George Maunder Lookout
- VP4 – view south west from Prospect Park public reserve
- VP5 – view south from Peter Brock Drive.

Each viewpoint was assessed according to the sensitivity of the receiver and magnitude of change during construction and operation. These factors were combined to determine the significance of the visual impacts. A summary of the viewpoint assessment is provided in Table 6-33.

Table 6-33 Viewpoint assessment summary

Viewpoint	Receiver type	Distance from proposal	Elevation	Sensitivity to change	Magnitude of change	Visual impact
VP1	Road/Motorist	500 m	66	Low	Low	Negligible
VP2	Road/Motorist	50 m	72	Low	Low-negligible	Low-negligible
VP3	Public	3.2 km	110	Moderate	Negligible	Negligible
VP4	Park user	3.4 km	63	Low	Negligible	Negligible
VP5	Road/Motorist	2.7 km	80	Low	Negligible	Negligible

Visual impact during construction and operation is expected to be low due to the low visibility of the site from public areas. Views of the PPTP are restricted by large areas of contiguous bushland and vegetated earthen bunds along Ferrers Road. Removal of foreshore vegetation to construct the proposal increases views from the east however visual receivers are at a distance of over 3 km.

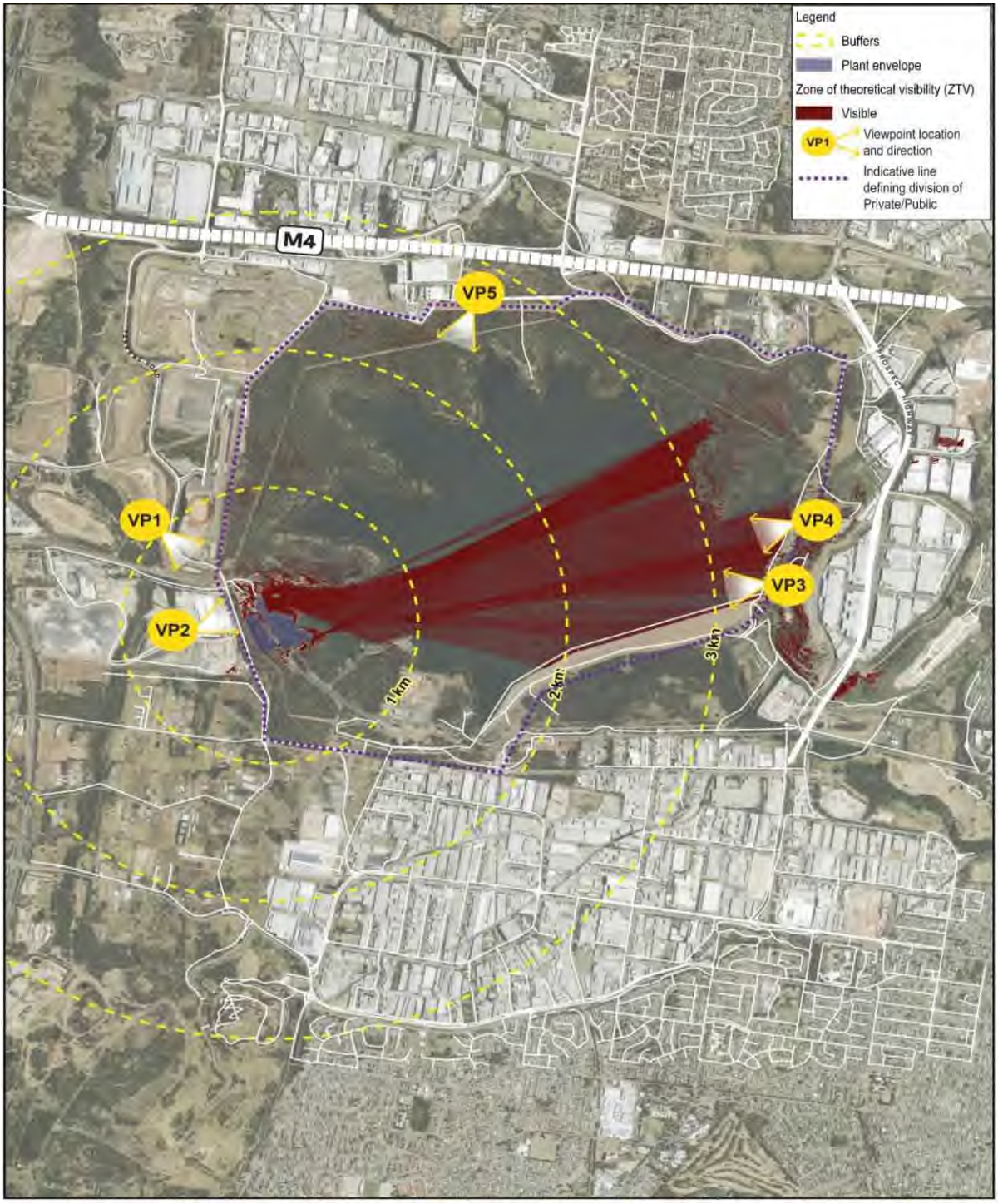

Figure 6-10 Public viewpoints of the PPTP

Landscape character

Two Landscape Character Units (LCUs) (see Figure 6-11) were identified in the study area based on distinguishing physical, natural or urban elements. These include:

- LCU A – Prospect bushland

- LCU B – Infrastructure facility.

LCU A is characterised by gently undulating terrain and natural bushland surrounding the reservoir, including the Prospect Nature Reserve. LCU B is characterised by industrial infrastructure including the Prospect WFP, ancillary water infrastructure and the Austral Bricks facility west of Ferrers Road.

Figure 6-11 Landscape Character Units

Each LCU was assessed according to the sensitivity and magnitude of change during construction and operation. These factors were combined to determine the significance of the landscape character impacts. A summary of the landscape character assessment is provided in Table 6-34.

Table 6-34 Landscape character assessment summary

LCU	Sensitivity to change	Magnitude of change	Landscape character impact
A – Prospect bushland	Moderate	Low	Low-moderate

LCU	Sensitivity to change	Magnitude of change	Landscape character impact
B – Infrastructure facility	Low	Low	Low

Impacts to the landscape character of Prospect bushland (LCU A) are low-moderate due to the loss of natural character from vegetation removal and infrastructure additions. Impacts to the landscape character of the surrounding infrastructure facilities (LCU B) are considered low as the works are in keeping with this character.

Visual character of the PPTP site will be enhanced with a landscaping design that is sympathetic to LCU A, including replanting of locally native Cumberland Plain species.

Lighting

The proposal will require operational lighting for security and safety purposes including street lighting along internal roadways and pathways and lighting of external plant areas. This lighting would be mounted on poles of various heights and on external building walls. It is highly unlikely that any light spill will impact neighbouring receivers.

Mitigation measures

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

Table 6-35 Environmental mitigation measures — social and visual

Mitigation measures
Undertake works in accordance with Sydney Water Communications policies and requirements including: • notify impacted residents and businesses • erect signs to inform the public on nature of work • personnel treat community enquiries appropriately.
Work sites will be restored to pre-existing condition or better.
Minimise visual impacts (e.g. retain existing vegetation where possible, replace tree canopy on site).
Direct artificial light away from sensitive receivers where possible (i.e. residents, fauna or roadways).
Maintain work areas in a clean and tidy condition.
Incorporate muted colours and materials that minimise glare in the larger, more prominent structures to reduce their presence in the landscape.

6.2.11 Cumulative and future trends

Cumulative impacts

Sydney Water reviewed DPHIs Major Projects Portal in September 2024 to identify nearby projects which were either active (e.g. preparing EIS, response to submissions stage) or had been determined in the last 10 years. Major projects in the vicinity largely relate to new or upgraded industrial and warehousing facilities around Prospect Reservoir, including Wetherill Park to the south, Pemulwuy to the east and Arndell Park and Huntingwood to the north. These nearby projects may have cumulative construction impacts with the proposal. Some of these projects are shown in Table 6-36.

Table 6-36 Nearby major projects

Type of work	Project name	Status	Location	Address
Expansion or modification	Widemere Waste Facility modification	Determined December 2023	About 200 m south and east of Sydney Water owned land at Prospect Reservoir	Widemere Road, Wetherill Park
Expansion or modification	Horsley Park Brickworks Plant 2 – Mod 1	Determined August 2022	Near Sydney Water owned land at Prospect Reservoir (opposite side of Ferrers Road)	780 Wallgrove Road, Horsley Park
Expansion or modification	Halgan Liquid Waste Treatment Facility	Prepare EIS	About 250 m south of Sydney Water owned land at Prospect Reservoir	10 Davis Road, Wetherill Park
New project	Horsley Park Bioenergy Facility	Prepare EIS	Near Sydney Water owned land at Prospect Reservoir	780 Wallgrove Road, Horsley Park
New project	Davis Road Data Centre (Cundall)	Exhibition	About 250 m south of Sydney Water owned land at Prospect Reservoir	3 Davis Road, Wetherill Park

Other potential projects which may have cumulative impacts with this proposal include:

- Prospect Reservoir recreation opportunities
- Western Sydney Freight Line – Stages 1 and 2 – corridor under investigation includes land south of Prospect Reservoir, within Wetherill Park
- Other Sydney Water and WaterNSW projects at Prospect Reservoir.

Other projects at Prospect Reservoir include augmentation works at Prospect WFP and other enabling works required for the PPTP to operate effectively (e.g. Package 2 and 3). WaterNSW plan to upgrade the Prospect Reservoir Pumping Station in March 2025. These works are likely to

take 18 months and will coincide with the PPTP construction. WaterNSW and their contractors will require 24/7 access through Gate 10 and the PPTP site, suitable for heavy vehicles, trucks and cranes to reach their work site. At the peak of construction, this would include about 10 heavy vehicle movements per day. Daily traffic would include earth moving machinery, concrete trucks and pumps, cranage and general construction vehicles.

Concurrent projects on site may result in increased noise and vibration impacts and congested access routes. The delivery contractor and Sydney Water will work closely with WaterNSW and PWP during delivery of this project to minimise cumulative impacts.

Future trends

Future trends that could impact the proposal were considered, such as bushfires, flooding, extreme heat and extreme storm events related to climate change.

The proposal has considered future climate scenarios in line with Sydney Water's position statement on Climate Change Adaptation. Sydney Water is targeting a Representative Concentration Pathway (RCP) of 4.5 with a pathway to achieve RCP 8.5 where appropriate. Projected changes that were considered and incorporated into the PPTP design are summarised below.

Heat

Average mean temperature is projected to increase by +1.1°C by 2030, and +2.7°C by 2070. To account for this, the design temperature range has been increased to 48°C. Consideration has been given to the expected life span of each asset within the plant and the appropriate design temperature range. This included a temperature rise of +1.1°C for shorter life equipment, such as pumps or air conditioning units, and a rise of +2.7°C for assets with longer design lives, such as switch rooms and concrete structures.

Fire

The study area is in bushfire prone land including Category 1 (forest/woodland), Category 3 (grasslands) and vegetation buffer areas. The PPTP footprint is mostly Category 3 (grasslands) with a small patch of Category 1 (forest/woodland) that would be cleared to make way for the proposal.

A Bushfire Assessment (GHD, 2023a) was undertaken to assess the potential for bushfire in the study area. The assessment found that a bushfire at the proposal site would be highly constrained and limited to a relatively small, developing fire within fragmented patches of woodland south of the PPTP. The most adverse fire winds (west to northwest) would push fire away from the PPTP. A fully developed bushfire at full potential rate of spread and intensity, is unlikely to occur due to the fragmented nature of adjacent bushland and the presence of water channels, roads and existing cleared power easements within the study area.

Rainfall extremes

The sites aboveground drainage system is designed for the 1 in 100 AEP rain event via overland flow. The sites underground drainage system will be able to accommodate a 1 in 10 AEP rain event. Any rain event exceeding the 1 in 10 AEP will follow overland flow paths to Prospect Reservoir. Due to the large buffering volume provided by Prospect Reservoir, stormwater run-off from rainfall extremes should not have a measurable impact on downstream flooding.

As noted in the Water Services Association of Australia Climate Change Adaptation Guidelines (WSAA, 2016), higher intensity rainfall, resulting from climate change, has the potential to impact infrastructure such as the PPTP. The guidelines note that there is no standard approach for representing this and identify potential sensitivity analysis with rainfall intensity increases of 10%, 20% and 30%. Detailed design would consider this sensitivity analysis in accordance with best practice at the time of design and include design allowance for a 10% increase at minimum.

The proposal is unlikely to further exacerbate future trends. Operation of the proposal will ensure Sydney Water can continue to supply drinking water that meets the ADWG even when raw water quality is impacted by extreme weather events.

Mitigation measures

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

Table 6-37 Environmental mitigation measures — cumulative and future trends

Mitigation measures
Continue to consult with key stakeholders that are constructing infrastructure within Prospect Reservoir with a view to coordinating works where practicable.
Regular communication with the WaterNSW Prospect Reservoir pumping station upgrade project team is required to coordinate construction activities and ensure 24/7 access is available for WaterNSW and their contractors to their work site.
An emergency preparedness and response plan is to be prepared for the site. This would include consultation with WaterNSW and PWP (operators of the Prospect WFP) due to the shared use of land within the proposal site and potential access requirements.
During the detailed design phase further consideration of upgrading all stormwater infrastructure to the 1 in 100 Annual Exceedance Probability (AEP) will be undertaken. If the extra capacity, associated with the 1 in 100 AEP design results in an improvement of discharge water quality to the reservoir it will be implemented.

6.2.12 General environmental management

Table 6-38 Environmental mitigation measures — general environmental management

Mitigation measures
Sydney Water's Project Manager (after consultation with the environmental and community representatives and affected landowners) can approve temporary ancillary construction facilities (such as compounds and access tracks), without additional environmental assessment or approval if the facilities: • limit proximity to sensitive receivers • do not disrupt property access • have no impact to known items of non-Aboriginal and Aboriginal heritage • are outside high risk areas for Aboriginal heritage • use existing cleared areas and existing access tracks • have no impacts to remnant native vegetation or key habitat features • have no disturbance to waterways • do not require additional safeguards beyond those included in the EIA • do not disturb contaminated land or acid sulfate soils • will be rehabilitated at the end of construction. The delivery contractor must demonstrate in writing how the proposed ancillary facilities meet these principles. Any facilities that do not meet these principles will require additional environmental impact assessment. The agreed location of these facilities must be shown on the CEMP site plan and appropriate environmental controls installed.
The delivery contractor must conduct pre-mobilisation and post-demobilisation soil sampling on compound sites to confirm no residual impacts.
Should the proposal change from the EIA, no further environmental assessment is required provided the change: • remains within the study area for the EIA and has no net additional environmental impact; or • is outside the study area for the EIA but: – reduces impacts to biodiversity, heritage or human amenity; or – avoids engineering (for example, geological, topographical) constraints; and – after consultation with any potentially affected landowners and relevant agencies. The delivery contractor must demonstrate in writing how the changes meet these requirements, for approval by Sydney Water's Project Manager in consultation with the environmental and community representatives.

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

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

- Go/no go areas and boundaries of the work area including locations of lay-down and storage areas for materials and equipment
- location of environmental controls (such as erosion and sediment controls, fences or other measures to protect vegetation or fauna, spill kits)
- location and full extent of any vegetation disturbance.

The CEMP will identify appropriate delineation with (e.g. metal fencing for AHIMs, white flagging for construction corridor, red flagging for no go zones etc). Delineate approved disturbance boundary before construction.

WaterNSW will be provided the opportunity to review the CEMP.

Comply with the Sydney Water and WaterNSW Access Protocol.

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

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

All site personnel must be inducted into the IMP.

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

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

An Operational Environmental Management Plan (OEMP) or equivalent should be developed that includes:

- site incident procedures
- chemical storage and handling procedures
- WorksSafe NSW licences
- maintenance requirements
- standard safety procedures
- standard operating procedures
- emergency and incident management procedures.

7 Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of the PPTP Augmentation and Upgrade program (Package 1). The proposal is required to improve the reliability and resilience of the Prospect Water System and protect Greater Sydney's drinking water supply.

The main potential construction environmental impacts of the proposal include erosion and sedimentation, vegetation removal, impacts to non-Aboriginal heritage, noise and visual amenity changes. During operation, the main potential impacts are associated with visual amenity, discharge to waters and waste generation. The main benefits are providing a more resilient and reliable water supply for Greater Sydney.

Given the nature, scale and extent of impacts and implementation of the mitigation measures outlined in this REF, the proposal is unlikely to have a significant impact on the environment. Therefore, an environmental impact statement is not required under Division 5.1 of the EP&A Act.

The REF considers how the proposal aligns with the principles of ESD. The proposal will result in positive long-term environmental improvements. 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.

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Appendices

Appendix A – Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	The proposal is expected to have minimal impact on the surrounding community. The site is not visible or accessible to the public and sensitive receivers are distant. There may be short-term impacts on the community from increased construction noise and traffic. During operation, minor additional visual impacts are expected. There will be environmental improvements by providing a reliable water service to Greater Sydney.
Any transformation of a locality	The proposal would not result in the transformation of a locality. The proposal will introduce new permanent water treatment infrastructure that is consistent with the existing land use of the site.
Any environmental impact on the ecosystems of the locality	The proposal will result in minor environmental impacts to ecosystems of the locality, including vegetation and waterways. Impacts would include removal of threatened vegetation and habitat for threatened species and discharge to waters. The impacts to flora and fauna are discussed in section 6.2.4 and are not considered to be significant.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposal is consistent with the existing land use of the site and would not result in a long-term reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality.
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	The proposal avoids impacts to known Aboriginal heritage items and impacts to unknown items are unlikely given the pre-disturbed nature of the study area (see section 6.2.5 for details). The proposal is located within the curtilage of a State heritage listed item, Prospect Reservoir and Surrounding Area. A Statement of Heritage Impact was completed and concluded that the proposal would not materially affect the items heritage value.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposal will have a non-significant impact on the habitat of protected animals. Small areas of threatened fauna habitat would be removed. Sydney Water's Biodiversity Offset Guideline will be implemented to reduce the long-term impact of the proposal and ensure habitat is re-established on site.
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.

Section 171 checklist	REF finding
Any long-term effects on the environment	The proposal would not have any long-term impacts on the environment but will have a long-term benefit ensuring the continued supply of drinking water during varying raw water quality conditions to meet future demand growth.
Any degradation of the quality of the environment	The proposal would result in a short-term degradation of the quality of the environment during construction. This would be a result of air quality, noise and vibration and water quality impacts, however these would be minimised through the implementation of the mitigation measures in this REF. The proposal would not result in any long-term degradation of the quality of the environment. The PPTP will occasionally discharge water to Prospect Reservoir, however these discharges are not expected to result in any degradation of the environment for any prolonged periods.
Any risk to the safety of the environment	The proposal will not increase risk to the safety of the environment. All chemicals required for operation of the PPTP will be stored appropriately to minimise the risk of spills/pollution of the environment.
Any reduction in the range of beneficial uses of the environment	The proposal would not result in any reduction in the range of beneficial uses of the environment as the site is currently used for water treatment and this use would remain the same.
Any pollution of the environment	Environmental mitigation measures will mitigate the potential for the proposal to pollute the environment. The proposal will result in discharges to Prospect Reservoir during operation. An EPL to pollute waters will be obtained from the EPA prior to any discharges occurring. No long-term pollution of the environment is expected.
Any environmental problems associated with the disposal of waste	Waste disposal will be in accordance with the environmental mitigation measures, and no environmental problems associated with the disposal of waste are expected.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposal will not increase demand on resources, that are, or are likely to become, in short supply.
Any cumulative environmental effect with other existing or likely future activities	The proposal may have a cumulative environmental effect if construction coincides with other existing or likely future activities, particularly other Sydney Water, WaterNSW and PWP works on the same site.
Any impact on coastal processes and coastal hazards, including	The proposal is in western Sydney and is distant from the coast. As such, the proposal will not have any impact on coastal processes or

Section 171 checklist	REF finding
those under projected climate change conditions	hazards, and coastal processes and coastal hazards will not have any impact on the proposal.
Any applicable local strategic planning statements, regional strategic plans or district strategic plans made under the EP&A Act, Division 3.1	The proposal is to service growth and the applicable strategic planning statements or plans have been considered in the system planning and options selection process. Refer to section 5.1 for details.
Any other relevant environmental factors.	The proposal has been assessed against the factors listed above, and there are no other relevant environmental factors to consider.

Appendix B – Consideration of TISEPP consultation

TISEPP section	Yes	No
Section 2.10, council related infrastructure or services – consultation with council		
Will the work:		
Potentially have a substantial impact on stormwater management services provided by council?		x
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		x
Connect to, and have a substantial impact on, the capacity of a council owned wastewater 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 (i.e. non-certified land)? *If*		x

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).		

Appendix C – Surface Water and Hydrology Assessment

Appendix D – Biodiversity Impact Assessment

Appendix E – Aboriginal Heritage Due Diligence and Heritage Impact Assessment

Appendix F – Noise and Vibration Assessment

Appendix G – Traffic Impact Assessment

Appendix H – Landscape and Visual Impact Assessment

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

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