Review of Environmental Factors

T38-N01 Prospect Reservoir (CWM) (April, 2025)

Sydney WATER

Table of contents

Determination 4

1 Executive summary 5

2 Introduction 6

2.1 Context 6

2.2 Proposal background and need 6

2.3 Consideration of Ecologically Sustainable Development 7

3 Proposal description 9

3.1 Proposal details 9

3.2 Field assessment area and changes to the scope of work 19

4 Consultation 20

4.1 Community and stakeholder consultation 20

4.2 Consultation required under State Environmental Planning Policies and other legislation 21

5 Legislative requirements 23

Environmental legislation 23

6 Environmental assessment 30

6.1 Existing environment 30

6.2 Environmental aspects, impacts and mitigation measures 30

6.2.1 Topography, geology and soils 32

6.2.2 Water and drainage 34

6.2.3 Flora and fauna 37

6.2.4 Heritage 41

6.2.5 Noise and vibration 50

6.2.6 Air and energy 58

6.2.7 Waste and hazardous materials 59

6.2.8 Traffic and access 62

6.2.9 Social and visual 64

6.2.10 Cumulative and future trends 66

6.2.11 General environmental management 67

7 Conclusion 69

References 70

Appendix A – Section 171 checklist 72

Appendix B – Canopy Consulting Arborist Report 75

Appendix C – Non-Aboriginal heritage reports 76

Appendix D – Consideration of TISEPP consultation 77

Appendix E – Neutral or beneficial effect on water quality (NorBE Assessment) 79

Appendix F – Aboriginal heritage due diligence (AHDD) 82

Appendix G – Conservation management plans (drafts) **83**
Appendix H – Noise mitigation measures – definition of recommendations **84**

Figures

Figure 3-1 Proposed compound location on an existing hardstand area within Andrew Campbell Reserve. Site is adjacent to William Lawson Drive and used as a public carpark. Refer to Figure 3-2 for proposal overview. 11
Figure 3-2 Proposal overview - key environmental constraints 15
Figure 3-3 Reservoir Road – key environmental constraints within NPWS 16
Figure 3-4 William Lawson Drive – key environmental constraints within NPWS 17
Figure 3-5 Corner Prospect HWY and Reservoir Road – key environmental constraints 18
Figure 6-1 Areas of Aboriginal archaeological potential (Extent Heritage 2024a – Appendix G) 42
Figure 6-2 Looking south, State heritage listed Hoop Pines along William Lawson Drive (Extent Heritage 2024a, Appendix G). 46
Figure 6-3 Aerial imagery showing current condition and approximate location of Tree 501 and Tree 502, per arborist assessment (Appendix B; refer below to Figure 6-4). 47
Figure 6-4 Tree 501 and Tree 502, located along William Lawson Drive (from Appendix B). 48
Figure 6-5 Day noise impacts and key sensitive receivers 53
Figure 6-6 Night noise impacts and key sensitive receiver 54

Tables

Table 2-1 Proposal need, objectives and consideration of alternatives 6
Table 2-2 Consideration of principles of ecologically sustainable development (ESD) 7
Table 3-1 Description of proposal 9
Table 5-1 Environmental planning instruments relevant to the proposal 23
Table 5-2 Consideration of key environmental legislation 25
Table 6-1 Environmental mitigation measures — topography, geology and soils 32
Table 6-2 Environmental mitigation measures — water and drainage 36
Table 6-3 Environmental mitigation measures — flora and fauna 38
Table 6-4 Summary of registered Aboriginal sites within 200 m of the proposal. 42
Table 6-5 Environmental mitigation measures — heritage 49
Table 6-6 Background noise levels and noise management levels (TfNSW 2022). 52
Table 6-7 Affected distance (metres) for sensitive receivers (day) – distanced-based scenario in a developed area 55
Table 6-8 Affected distance (metres) for sensitive receivers (night) – distanced-based scenario 55
Table 6-9 Environmental mitigation measures — noise and vibration 57
Table 6-10 Environmental mitigation measures — air and energy 59
Table 6-11 Environmental mitigation measures — waste and hazardous materials 61
Table 6-12 Environmental mitigation measures — traffic and access 63
Table 6-13 Environmental mitigation measures — social and visual 65
Table 6-14 Environmental mitigation measures — cumulative and future trends 67
Table 6-15 Environmental mitigation measures — general environmental management 67

Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of T38-N01 Prospect Reservoir project (the proposal). 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 impacts from noise and traffic, biodiversity, heritage, and ground disturbance. During operation, potential impacts would be limited to maintenance. 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]	[redacted]	[redacted]	[redacted]
Ellen Curtis REF author Sydney Water Date: 10/04/2025	John Eames Snr Env Scientist Sydney Water Date: 14/04/2025	Johnny Kim Project Manager Program delivery Sydney Water Date: 28/04/2025	Murray Johnson Snr Mgr Environment and Heritage Sydney Water Date: 30/04/2025

1 Executive summary

The Critical Watermain Renewal program is an initiative established by Sydney Water. This program identifies drinking water trunk main assets that require renewal. As part of the program, the T38-N01 main was identified for renewal due to ongoing issues with leaks. The existing main is located at Prospect Reservoir and falls within the Prospect Nature Reserve. This area is within National Parks and Wildlife Services (NPWS) land and a Water NSW Special Area. The former has meant past access to the watermain for maintenance and repairs have required complex approvals in the sensitive area. Sydney Water has determined continual repairs of leaks does not address the underlying issue and it is not the most economic renewal approach in the long term. A new alignment has been proposed, which, except for connection points, would move most of the main outside of NPWS and Water NSW land.

A Construction Environmental Management Plan (CEMP), including a Soil and Water Management Plan, will be prepared by the delivery contractor to mitigate potential environmental impacts during construction.

The proposal will result in positive long-term benefits by improving the reliability and resilience of the water supply network, reducing future impacts to NPWS and Water NSW.

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 renewal of T38-N01 within the Prospect Reservoir region and identifies mitigation measures that avoid or minimise potential impacts.

2.2 Proposal background and need

Sydney Water proposes the renewal of T38-N01 critical water main (CWM). The project requires the construction of a new pipeline and decommissioning of existing assets that are currently within Prospect Nature Reserve. Completion of these works would ensure Sydney Water meets its obligation to provide an adequate drinking water service, while reducing our impact on National Parks and Water NSW land.

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

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

Aspect	Relevance to proposal
Proposal need	The proposal is part of the Critical Watermain Renewal program. This work is required to ensure an ongoing and reliable source of drinking water is provided to our customers, whilst addressing reoccurring leaks, and maintenance difficulties associated with the existing pipeline passing through NPWS land and a Water NSW Special Area. The proposal will require some work within NPWS and Water NSW land, however, most of the proposal will be restricted to within the road corridor of William Lawson Drive and Reservoir Road.
Proposal objectives	The proposal objectives are: • construction of approximately 2,370m of DN900 • decommission approximately 1,550m of DN750 CICL (T38-N01). • decommission approximately 1,010m of DN500 CICL (T27-N04). Decommissioned assets will be capped and remain in situ unless otherwise described. Open trenching is the preferred construction methodology unless otherwise stated.

Aspect	Relevance to proposal
	The existing watermain and some of the connection points for the proposed main are located within Prospect Nature Reserve, within the Sydney Drinking Water Catchment and is a designated Water NSW "Special Area". As such, approvals from both NPWS and Water NSW are required as part of access requirements. Work within NPWS land will consist predominantly of decommissioning T38-N01, capping of existing assets to be decommissioned, and construction of two connection points for the new DN900 alignment.
Consideration of alternatives/options	Four options were considered, including a like-for-like option where the alignment would remain within the existing easement. After review of risks, Option 3 was selected as the preferred option to continue to concept design. Generally, Option 3 achieves the proposal objectives with an acceptable level of risk at the least cost, while reducing our ongoing impact (e.g. maintenance) on NPWS and Water NSW land. • Option 3: - construction of approximately 2,370m of DN900 - decommission approximately 1,550m of DN750 CICL (T38-N01) - decommission approximately 1,010m of DN500 CICL (T27-N04).

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 scientific uncertainty relating to the proposal. The proposal has been designed to minimise impact on sensitive environments and will ensure a reliable supply of drinking water into the future.
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 reliable water service.

Principle	Proposal alignment
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 on biological diversity or impact ecological integrity. The proposal has been designed to avoid impacting significant vegetation by remaining within the roadway and verge and outside of root zones, where possible. At the time of writing, no impacts to vegetation within NPWS are proposed (including trimming and removal). If vegetation impacts within NPWS are needed, further impact assessment and discussions with NPWS will be required. If required, impacts to non-threatened native vegetation outside of NPWS land will be offset in accordance with Sydney Water's Biodiversity Offset Guideline.
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 positive outcomes for the community and environment. The proposal would provide long-term sustainable water infrastructure to provide optimum outcomes for the community and environment.

3 Proposal description

3.1 Proposal details

Table 3-1 describes the proposal and Figures 3-1 – 3-4 show the proposal location and key environmental constraints.

Table 3-1 Description of proposal

Aspect	Detailed description
Proposal description	The proposal involves renewing the existing T38-N01 by decommissioning the existing main and laying a new DN900 main via open trenching. This work is required to address ongoing issues (leaks) within NPWS land, within which the current main is located. Activities proposed will be located within and adjacent to NPWS land (see Figures 3-1 to 3-5, and outline below), with most of the proposal (duration and activities) occurring outside NPWS land. The proposal will require: • ground excavation/trenching for pipe laying and decommissioning existing assets • minor vegetation impacts (including trimming and/or removal) outside NPWS land - No trimming or removal of State heritage listed Hoop Pines, located along William Lawson Drive is required, or approved. - For safety reasons, removal of two *Jacaranda* sp. trees (Tree 501 and Tree 502, see Appendix B) that are located along William Lawson Drive is required, due to impacts to the roots from trenching. - Impacts to vegetation within NPWS is not proposed, including trimming and removal. • impacts to the roadway • access via existing road networks, unsealed fire trails, and some traversal across open areas. No new permanent access tracks will be required for site establishment and construction works. Scope activities outside NPWS / Water NSW land: • construct approximately 2,370m of DN900, predominantly within the verge / roadway of William Lawson Drive and Reservoir Road

Aspect	Detailed description
	via open trenching, including a connection at the intersection of William Lawson Drive and Reservoir Road • decommission approximately 1,010m of DN500 CICL (T27-N04), extending below ground northeast from the southern end of William Lawson Drive to the intersection of Reservoir Road with Prospect Highway. Scope activities within NPWS / Water NSW land: • decommission approximately 1,550m of DN750 CICL (T38-N01) which extends below ground northwest from William Lawson Drive through Prospect Nature Reserve. • two connection points for newly constructed DN900, located off William Lawson Drive and Reservoir Road.
Location and land ownership	The proposal is located along Reservoir Road and William Lawson Drive within the Blacktown Local Government Area. Most of the proposal, including construction of the new DN900 alignment, is located adjacent to Prospect Nature Reserve (operated by NPWS). Limited activities, including capping and decommissioning of the existing asset, and completing the DN900 connection, are required within the reserve. Access to the reserve will be via existing gates/tracks. Some minor traversal across open, grassed areas will be required within the fence line of the reserve. William Lawson Drive is a public road within Sydney Water property, which includes Andrew Campbell Reserve. The proposal is within an area under the Western Parklands City SEPP. The roadways and adjacent reserve area are heritage listed at the local and/or state heritage level. A statement of heritage impact (SoHI) and archaeological assessment have been conducted, and an s.60 approval obtained (Appendix C). Minor vegetation impacts (including removal and trimming of trees) will be required outside of NPWS land. At the time of writing, no impacts to vegetation within NPWS are proposed. If vegetation impacts within NPWS are needed, further impact assessment will be required.
Site establishment and access tracks	Site establishment would include the installation of structures such as erosion and sedimentation controls, traffic controls, any approved minor vegetation removal, erection of signage and demarcation of no-go areas. Site establishment may also include surveys, service location, geotechnical investigations or other investigations required prior to

Aspect	Detailed description
	construction. It may also include service relocation where services are identified that may be affected. Predominantly, access to the site will be via existing roadways and fire trails. Contractor vehicles would be parked within the construction compound (indicatively located within an existing sealed carpark within Andrew Campbell Reserve) where practicable and on the road verge where necessary. Traversal over open grassy areas is required within NPWS land; however, installation of new access tracks is not proposed.
Ancillary facilities (compounds)	A construction compound will be required to house site sheds, construction amenities, plant and equipment, and materials laydown. Proposed compound location is shown on Figure 3-1. The proposed location consists of a previously cleared hardstand area that is currently a public carpark within Andrew Campbell Reserve.  **Figure 3-1** Proposed compound location on an existing hardstand area within Andrew Campbell Reserve. Site is adjacent to William Lawson Drive and used as a public carpark. Refer to Figure 3-2 for proposal overview. In addition to the above proposed compound location, construction laydowns for material and equipment may be required and will be established progressively along the construction corridor. The exact location of these additional laydown sites will be chosen by the contractor, in consultation with the landowner(s) and approved by Sydney Water's Project Manager as described in the safeguards in Section 6.2.
Methodology	Investigations and site establishment Site establishment and investigative works will include geotechnical, contamination and survey work and/or potholing for existing services. Site preparation works will include:

Aspect	Detailed description
	• minor removal/trimming of vegetation (outside NPWS/Water NSW land) • establishing temporary compounds and access roads • installing erosion and sediment controls • traffic management measures • removal of pavement, footpath and/or road surfaces. Open trenching including pit construction Construction would primarily be through open trenching methods, with trenching proposed to be about 2 m wide and 2.5 m deep. Construction activities associated with this would include: • excavation of trenches, including stockpiling of spoil material on the upslope side of trenches, or at temporary site compounds • shoring and dewatering of trenches, depending on trench depth and groundwater levels • spreading of granular material such as sand or gravel along the bottom of the trench before pipe laying • installing the water pipeline • backfilling the trench with bedding material and excavated soil • compacting trench fill material and restoring areas disturbed by the works • testing and commissioning the pipeline.
Commissioning	Testing and running the new equipment to ensure it works correctly and is integrated with existing plant operations. The exact commissioning steps depend on the type of the equipment, but typically include: • pressure testing, flushing, leak checks, cleaning and disinfection of the new main with super chlorinated water.
Restoration	The work site will be restored to the pre-existing condition following construction, in consultation with landowners. Site restoration would include: • dismantling of compounds, removal and disposal of waste material and removing construction signage and hoardings

Aspect	Detailed description
	• restoring ground cover and vegetation, including any offset requirements, if required • restoration of road pavement surfaces and drainage where pipework is trenched into place • removal of erosion and sediment controls, temporary fencing and any traffic control measures.
Materials/ equipment	Proposed materials, equipment and plant include: • shoring plates and road plates • mechanical root cutter (if required) • chainsaw and mulcher (if required) • bypass hoses and pump system for any groundwater seepage • light and heavy vehicles such as traffic control vehicles, vacuum truck, concrete trucks, worker vehicles, tipper trucks, street sweepers, and bobcats • excavators (up to 30 tonne, addition of rock hammers if required) • roller (up to 4 tonne) • power tools such as concrete saw, rock hammers/jackhammers, pavement saws, grinders, and compactors • welders, compressors, generators (5 kV diesel), dewatering pumps • hand tools • pipes, valves, and other new/replacement parts • laydown/compound equipment such as portable amenities, lighting, crib sheds, storage containers, and waste bins.
Work hours	Work and deliveries will be scheduled to occur during standard daytime hours of: • 7 am to 6 pm, Monday to Friday • 8 am to 1 pm, Saturdays. The proposal is expected to require work outside these hours, for safety and/or to reduce impacts (e.g. traffic) at different times (e.g. for work in roads or delivery of oversize equipment), and pending road occupancy licences (ROLs) requirements. This has been assessed and mitigation measures are provided in Section 6.2.

Aspect	Detailed description
Proposal timing	Construction is expected to start late 2025 and take about 12-months to complete. Access to NPWS land is anticipated to require up to ten days only and all access protocols and notification requirements (i.e. for NPWS and Water NSW) will be followed prior to entry and upon completion of activities on site.

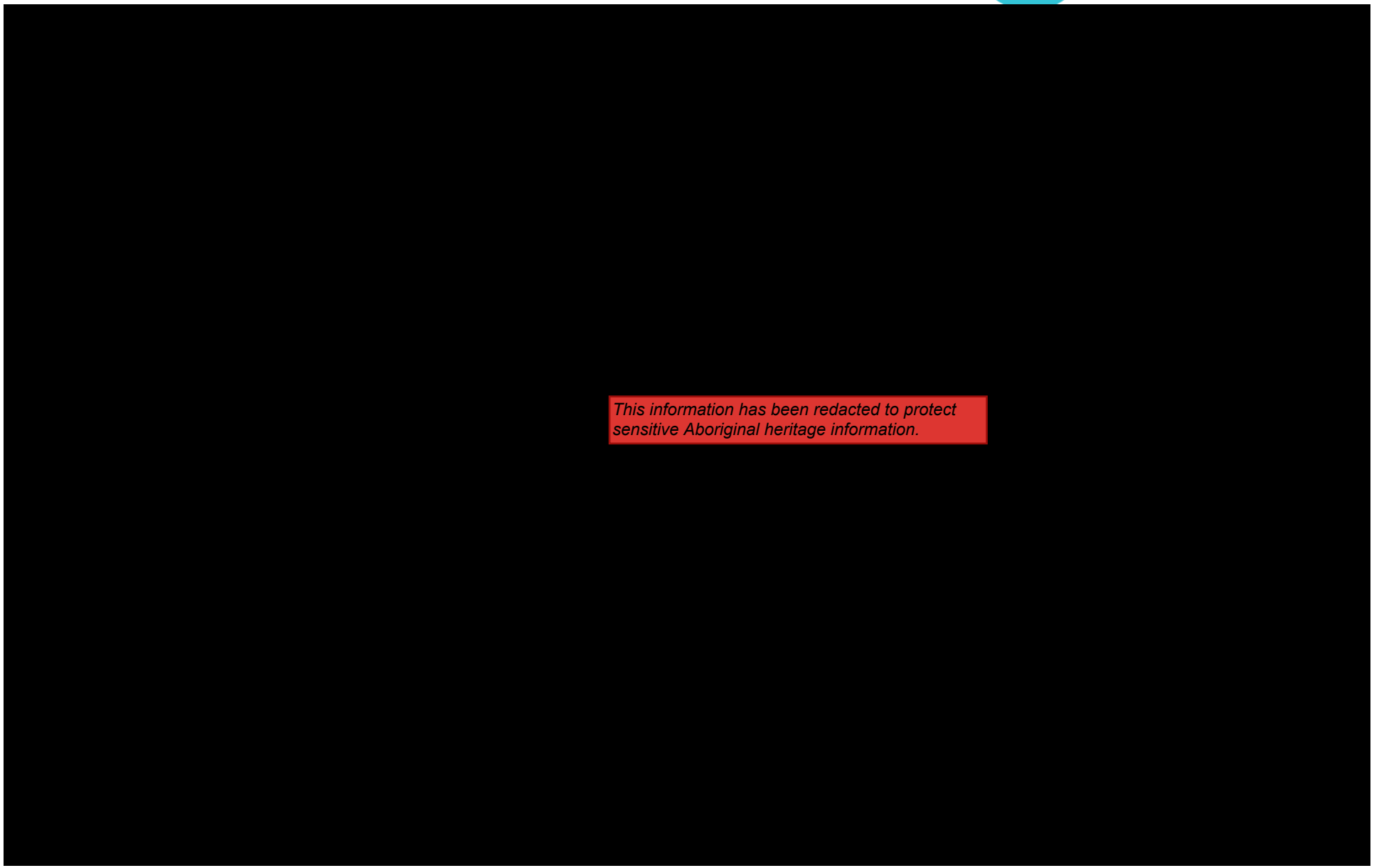

Figure 3-2 Proposal overview - key environmental constraints

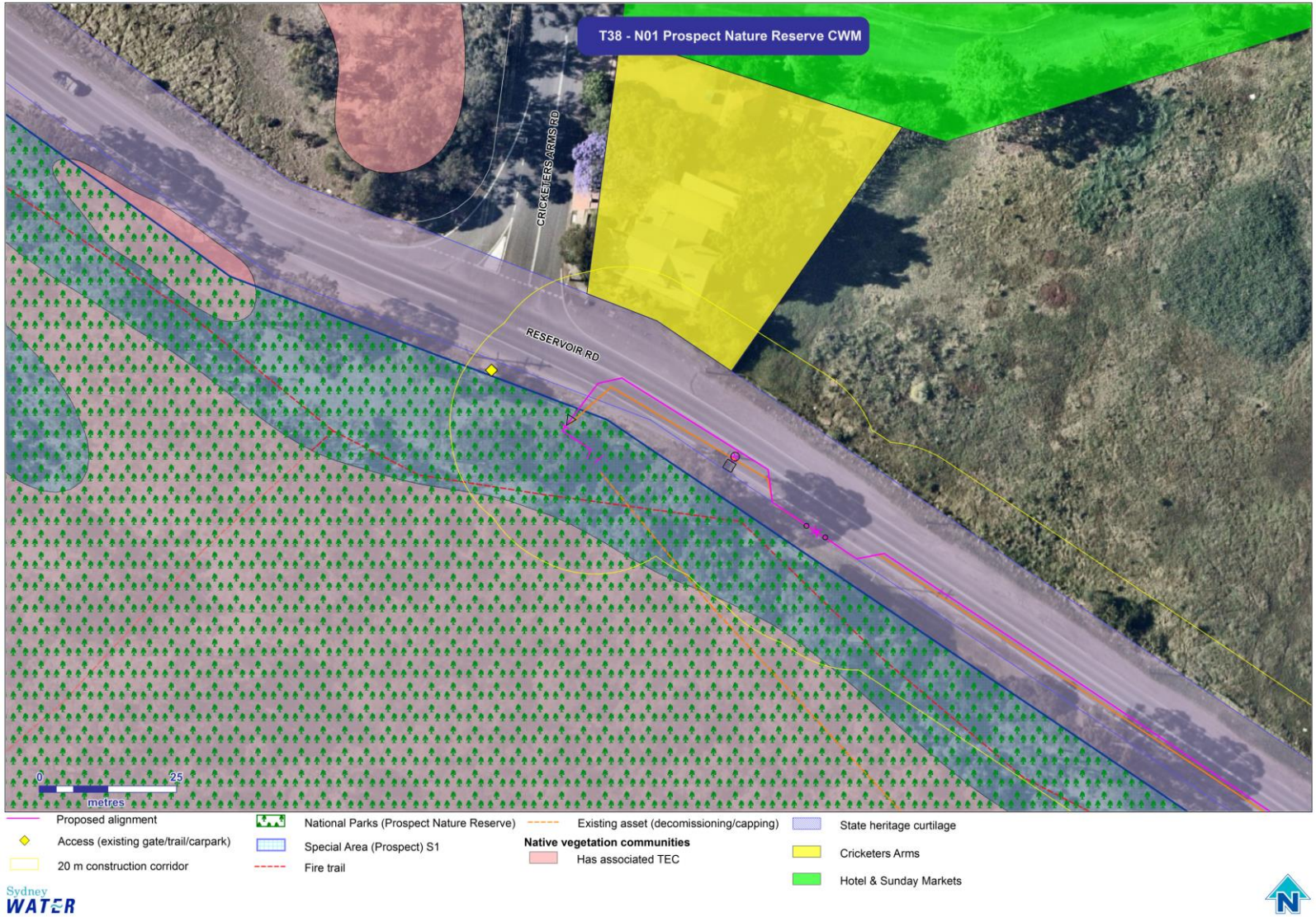

Figure 3-3 Reservoir Road – key environmental constraints within NPWS

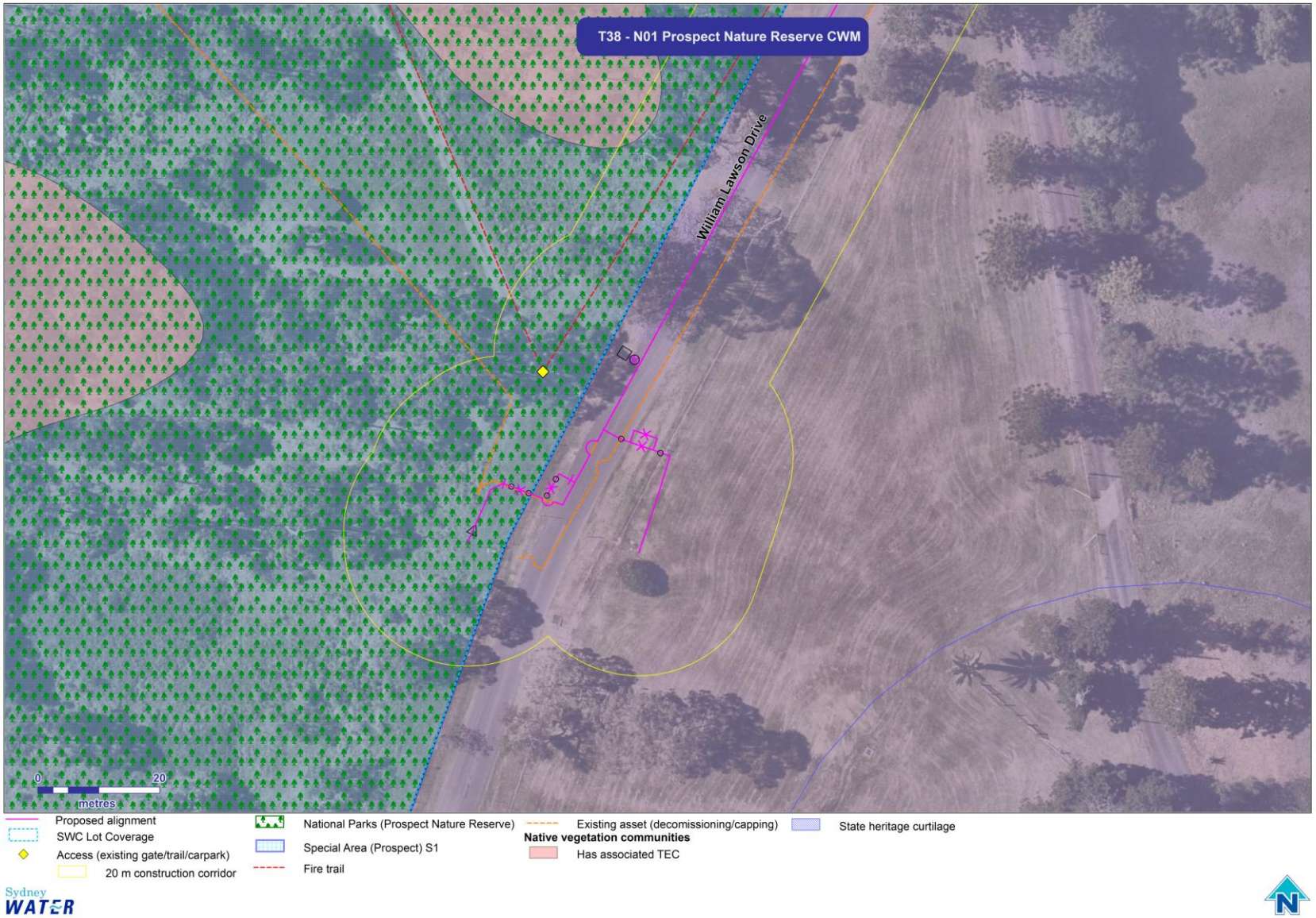

Figure 3-4 William Lawson Drive – key environmental constraints within NPWS and State heritage curtilage

Figure 3-5 Corner Prospect HWY and Reservoir Road – key environmental constraints

3.2 Field assessment area and changes to the scope of work

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

An addendum is not required provided the change:

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

Changes to the proposal outside the study area can only occur:

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

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

4 Consultation

4.1 Community and stakeholder consultation

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

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

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

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

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

Key stakeholders consulted concerning the proposal, have and will include:

- Water NSW
- NPWS
- Heritage NSW
- Blacktown Council
- TfNSW
- Local businesses, including Raging Waters Sydney, Royal Cricketers Arms, St Mark's Coptic Catholic Church Prospect, Berry Patch Preschool and Long Day Care Centre and Pecky's Disability Services
- Local residences.

4.2 Consultation required under State Environmental Planning Policies and other legislation

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

Consultation is required under s 2.10 (1f) of the TISEPP as the proposal involves *excavation of a council managed road*. Sydney Water notified Blacktown City Council of the works 07 January 2025. At the time of writing, no response from council has been received. The delivery contractor will continue to consult with Blacktown Council and any requests considered as part of the CEMP. Further details provided in Appendix D.

Sydney Water notified the Bradfield Development Authority (previously the Western Parkland City Authority) of the proposal on 24 September 2024 as the proposal has a capital investment value of over $30 million and is in the Western City operational area (Appendix D). At the time of writing, no response has been received.

NPWS and Water NSW consultation summary

- Part of the alignment is '*adjacent to a national park, nature reserve or other area reserved under the National Parks and Wildlife Act 1974*'. In accordance with s 2.15 (2a) of the TISEPP written notification to the Department of Planning and Environment (National Parks & Wildlife Service - NPWS) was completed via email on 18 September 2024. At the time of writing, a response has not been received. According to the protocol, the project has been assessed as a Type B proposal (refer below for further details).
- Part of the alignment is located *within* Prospect Nature Reserve and will have direct impacts on NPWS land. Consultation steps taken were:
    - NPWS was consulted via email on 18 September 2024 about the proposal in accordance with the NPWS - Access Consent and Protocol. Notification included the submission of the proforma requesting endorsement of works as a Type B proposal. As per the notification proforma, "*Endorsement is not required for Type A works, excluding Type A Drone Operations. For other works, Endorsement is deemed to be given for this proposal if NPWS does not, within seven (7) days of receipt, advise Sydney Water of non-endorsement, requirements for further information or special conditions.*"
    - On the 18 November 2024, a follow up email was sent noting that Sydney Water deems endorsement of the proposal by NPWS has been given, as it has been more than seven days since our initial notification and a reply was not received. As such, Sydney Water's standard mitigation measures have been applied and are provided in Section 6.2 of the REF.
    - As per the protocol, for Type B activities, a phone call to the Local Area Office is required prior to the activity occurring.
- Prospect Nature Reserve, operated by NPWS, is also a Water NSW Schedule 1 (special) area. Subsequently, the Sydney Water and Water NSW Access Protocol was followed.

- Under the Sydney Water and Water NSW Access Protocol, activities conducted within a Water NSW Special area on land owned and/or managed by the National Parks and Wildlife Services require consent under the NPWS Access Agreement. Under the NPWS Access Agreement, works are a Type B proposal (see above notification steps).
- Sydney Water contacted Water NSW regarding the proposal via email on 23 September 2024 to confirm notification requirements.
- Water NSW responded to the above notification on 2 October 2024, and confirmed that prior to commencing works, any development within the catchment would require completion of a:
    - Neutral or Beneficial Effect (NorBE) assessment (see Appendix E), and
    - Access Protocol Notification form (as per the SWC/ WNSW Access Protocol). As part of the submission of the Access Protocol Notification form, Water NSW requires attachment of the completed NorBE, NPWS response to the proposal, and determined REF.

Water NSW reviewed the draft REF in January/February 2025, with subsequent review and comments provided March/April 2025. Water NSW's feedback was considered and has been incorporated into this document. On April 9th, 2025, Water NSW confirmed all items had been addressed to their satisfaction and they had no further comments.

5 Legislative requirements

Environmental legislation

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

The following environmental planning instruments (Table 5-1) and legislation (Table 5-2) are relevant to the proposal. Table 5-2 also documents any licences and permits required, and timing and responsibility for obtaining them.

Table 5-1 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Blacktown Local Environmental Plan 2015 (Blacktown LEP) State Environmental Planning Policy (Precincts—Western Parkland City) 2021 (Western Parkland City SEPP)	The proposal is located on land zoned General Industrial (E4) (cross connection corner of Prospect HWY and Reservoir Road), under the Blacktown Local Environmental Plan 2015. The remainder of the proposal is not zoned under this LEP, as it is located within the Western Sydney Parklands and is therefore subject to the provisions of SEPP (Precincts – Western Parkland City) 2021.
State Environmental Planning Policy (Precincts—Western Parkland City) 2021 (Western Parkland City SEPP)	**Chapter 7 Western Sydney Parklands** The proposal is located on land within the Blacktown LEP being subject to the Western Parklands City SEPP. The Western Parklands City SEPP provides planning controls to ensure that the parklands are developed into a multi-purpose urban parkland for western Sydney. Under part 7.2 of the Western Parklands City SEPP, the proposal site is partially unzoned under the relevant LEP. Part 7.5A of the Western Parklands City SEPP states that Western Parklands is taken to be a prescribed zone for the purposes of *State Environmental Planning Policy (Transport and Infrastructure) 2021*, Part 2.3. With the application of this clause, the

Environmental Planning Instrument	Relevance to proposal
	proposal is therefore permissible without consent under clause 2.159(1) of the TISEPP (see below). The proposal is consistent with the aims of the Western Parklands City SEPP as the proposed works would be contained to previously disturbed land, including Sydney Water owned land and limited vegetation impacts are proposed. The works therefore are not considered to impact upon the parklands and would not result in a reduction in the environmental values on the parklands. In accordance with section 7.1(c), allow for and facilitate the location of government infrastructure and service facilities in the Western Parklands.
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Under section 2.159(1) of the SEPP (Transport and Infrastructure 2021, development for the purpose of water reticulation systems may be carried out by or on behalf of a public authority without consent on any land. As Sydney Water is a public authority, the proposal is permissible without consent. There are some limitations for work within National Parks. Under section 2.159(5) of the SEPP (Transport and Infrastructure 2021, development for the purpose of water reticulation systems water supply systems in land reserved under the *National Parks and Wildlife Act 1974* may only be carried out if it is authorised under that Act. As the proposal will be completed under the Joint Access protocol section 2.159(5) does not apply.
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

Environmental Planning Instrument	Relevance to proposal
	regulated catchment area. General planning considerations, policies and strategies concern potential impacts to matters including potential environmental impacts on water quality and quantity, aquatic ecology, flooding, access, cultural heritage, flora and fauna, and scenic quality. These and other environmental matters have been considered in the environmental assessment in Section 6.2. The assessment confirmed that potential impacts are negligible and meet the requirements of Part 6.5 of the SEPP. In accordance with section 171A of the EP&A Regulation Sydney Water has assessed the neutral or beneficial effect on water quality (NorBE) as the works are in the Sydney Drinking Water Catchment area (per the *Neutral or Beneficial Effect on Water Quality Assessment Guideline* (Water NSW , 2022), refer to Appendix E. The assessment confirmed that potential impacts are neutral.

Table 5-2 Consideration of key environmental legislation

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Protection of the Environment Operations Act 1997 (POEO Act)	Part 5.7 of the POEO Act requires that pollution incidents are immediately reported to the relevant authority where material harm to the environment is caused or threatened. The definition of material harm and the relevant authorities are in Part 5.7 of the POEO Act. The contractor is responsible for reporting actual or potential environmental harm, in accordance with SWEMS0009.	Notification	As needed, contractor
Biodiversity Conservation Act 2016 (BC Act)	The BC Act lists threatened species, populations and ecological communities to be considered in deciding whether there is likely to be a significant impact on threatened biota,	REF	Pre-construction, Sydney Water

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	or their habitats. If any of these could be impacted by the proposal, a assessment of significance 'Test of Significance' (ToS) that addresses the requirements of section 7.3 of the BC Act must be completed to determine the significance of the impact. Removal of threatened vegetation communities is not required. Direct impact to threatened species or vegetation communities is not proposed. Potential indirect impact to threatened species, communities and their habitats is described in Section 6.2.3.		
National Parks and Wildlife Act 1974 (NPW Act)	This Act provides for the establishment, preservation, and management of areas such as national parks, state conservation areas, nature reserves, and Aboriginal areas. The NPW Act provides for the protection of Aboriginal objects and places. Section 86 of the NPW Act states a person must not harm an Aboriginal object, however an application for an Aboriginal heritage impact permit (AHIP) may be made under Section 90A. Several registered AHIMS sites are within 200 m of the proposal; however, the proposal construction corridor does not overlap any registered sites, nor is the proposal expected to cause harm to any known Aboriginal object. Accordingly,an AHIP is not required. Under the NPW Act, land surrounding Prospect Reservoir is reserved as part of the Prospect Nature Reserve.	NPWS access consent	Post REF, pre-construction, Sydney Water

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	Sydney Water has liaised with NPWS as per the Access Protocol. Refer to Section 6.2.4 of this REF for discussion of the due diligence steps taken (Appendix F).		
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, being the former Great Western Highway (now sections of Reservoir Road – SHR#01911) and Prospect Reservoir (SHR#01370) and will be adjacent to two other items of State heritage significance, being the Royal Cricketers Arms Inn (SHR#00660) and Veteran Hall – House Remains (SHR#1351). A statement of heritage impact (SoHI) assessment and subsequent archaeological assessment were undertaken for the proposal. Heritage reports informed the projects application for a section 60 approval (refer to Section 6.2.4 and full reports in Appendix C).	s60 approval	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	WSWA (for <3ML) and WAL (for >3ML)	During or post REF if >3ML known during planning (Sydney Water to initiate). If unknown, pre-

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	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. At the time of writing, the anticipated volume of groundwater required to be dewatered is expected to be limited with the exact volume unknown. A WSWA will be obtained prior to dewatering.		construction, contractor.
Roads Act 1993	This Act regulates works in, on, or over a public road. Approval under Section 138 of this Act is required for carrying out works in, digging up, or disturbing a public road. Most of the alignment proposes open trenching construction methods, within the road corridor. A Road Occupancy Licence (ROL) would be required from the relevant roads authority prior to work on public roads and any temporary road closures during construction of the proposal. Partial road closure along Reservoir Road, to create a one-way direction for the duration of works, is proposed. For William Lawson Drive, which is located within Sydney Water land, full road closure is proposed, and a detour will be in place, if required for the duration of works.	Road Occupancy Licence	Pre-construction, contractor
Water NSW Act 2014 (Water NSW Act)	Parts of the proposal are on Water NSW land in the Prospect Schedule 1 Special Area. Under the Water NSW Act, Water NSW controls development and activities by public authorities within designated Special and Controlled Areas. The	Landowner consent Notification to Water NSW (inc. REF review)	During REF, Sydney Water

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	Water NSW Act requires either notice to and/or approval from Water NSW before public authorities undertake activities within these areas. Sydney Water owned land is considered private land and is excluded from the Special Areas. The work will be in accordance with Joint Access Protocol (D0000755). Where the proposal overlaps Water NSW jurisdiction, the area falls with Prospect Nature Reserve, an area managed by the National Parks and Wildlife Reserve (NPWS). As the land is within an area managed by NPWS, the NPWS Access Agreement applies.	and NPWS, as per joint protocols.	

6 Environmental assessment

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

6.1 Existing environment

The proposal is located along Reservoir Road and William Lawson Drive within the Blacktown Local Government Area. The proposal intercepts Prospect Nature Reserve, a Water NSW area, Sydney Water land, and the local road network. The land surrounding nearby Prospect Reservoir forms part of the Water NSW Prospect Special Area (Schedule 1). The later area outlines where public access is not to be undertaken to ensure the security of the water storage within Prospect Reservoir.

Prospect Nature Reserve is reserved under the *National Parks and Wildlife Act 1974*. This area is not accessible to the public due to its position within the Prospect Special Area (as outlined above). For the current proposal, minimal access to Prospect Nature Reserve (NPWS) required, and only to enable decommissioning of existing assets, and connections to the new proposed asset. The new asset will be outside of the reserve and located within the adjacent roadways.

William Lawson Drive is a public road within Sydney Water Property (including Andrew Campbell Reserve and listed as Grounds - G0990 Prospect Reservoir Public Areas in Sydney Water's asset database). The proposal is within an area under the Western Parklands City SEPP. Vegetation impacts (including removal and trimming of trees) or establishment of new permanent access tracks is not required within NPWS or Water NSW land. However, minor removal of vegetation tha t is non-threatened and/or with low historic value is proposed outside of NPWS land.

Aboriginal heritage sites are found throughout Sydney, particularly around waterways; however, impact to registered sites within the vicinity of the proposal is not expected (see Section 6.2.4 for discussion). The proposal falls within two non-Aboriginal State heritage items and a SoHI and subsequent archaeological assessment were obtained to inform the project. Sydney Water has received s.60 approval for impacts to state heritage items, as per the Heritage NSW approved plans (see Appendix C).

Further information regarding the existing environment is outlined in Section 6.2.

6.2 Environmental aspects, impacts and mitigation measures

Several geotechnical and contamination reports, based on desktop reviews and site studies were completed to inform the proposal design, including:

- Aurecon Arup (2023), CWM T38-N01 Prospect Nature Reserve, Geotechnical Investigation Plan. Sydney Water.

- Aurecon Arup (2024), CWM T38-N01 Prospect Nature Reserve, Geotechnical Factual Report. Sydney Water.
- Sydney Water (2023a), Prospect T38-N01 CWM Renewal Concept Design, Preliminary Site Investigation. Sydney Water.
- Sydney Water (2023b), Renewal Project CWM T38-N01 Prospect Nature Reserve, Geotechnical Desktop Study. Sydney Water.
- Sydney Water (2024a), CWM T38-N01 Prospect Nature Reserve, Geotechnical Interpretive Report. Sydney Water.
- Sydney Water (2024b), Prospect T38-N01 CWM Concept Design, Detailed Site Investigation. Sydney Water.

Several management plans for the proposed construction footprint and surrounding area are available, and provide insight into past and present land use, flora and fauna, and heritage overlapping and surrounding the proposal, including:

- Sydney Water (2021), Prospect Reservoir, Reservoir Road WS0095 Property Environmental Management Plan. Sydney Water.
- Office of Environment and Heritage (OEH) (2012), Prospect Nature Reserve Plan of Management. OEH.
- Extent Heritage (2024a – Nov Draft 01), Prospect Reservoir Conservation Management Plan. Sydney Water.
- Extent Heritage (2024b – Nov Draft 01), Veteran Hall Archaeological Site CMP. Sydney Water.

Two heritage reports were completed to inform the project and s.60 application:

- Aecom (2024), Prospect Water Mains Statement of Heritage Impact (SoHI). Aecom Australia.
- Aecom (2025), Prospect Rising Main, Prospect NSW: Addendum Archaeological Assessment to SoHI. Aecom Australia.

Findings from these reports have informed the current REF and are summarised below in sections:

- 6.2.1 – topography, geology and soils
- 6.2.2 – water and drainage
- 6.2.3 – flora and fauna
- 6.2.4 – heritage
- 6.2.7 – waste and hazardous material.

6.2.1 Topography, geology and soils

Existing environment and potential impacts

The proposal will predominantly be located within the road corridor and previously disturbed ground, and is located within an area consisting of undeveloped, rural, agricultural, and vegetated lots from the 1940s. Slight filling, redevelopment and construction of new buildings has occurred over the years. A review of historical imagery indicates that the vegetated area consisting of present-day Prospect Nature Reserve, has progressively expanded its coverage from the 1940s to present. Today, the study area is comprised of a nature reserve, Raging Waters Sydney, Blacktown Markets and various industrial buildings.

The topography across the site is generally flat. The proposal is typically underlain by shale deposits and sits within the Blacktown soil landscape. Works are within an area of localised and extensive salinity hazard, with no risk of acid sulfate soils (ASS) mapped in the proposed construction area.

During construction, ground will be disturbed/excavated, vegetation removed, and soil stockpiled which could result in potential offsite erosion and sedimentation of surrounding land and waterways. Also, there is the potential for soil to become contaminated through accidental chemical or fuel spills and leaks from plant and equipment during construction. Inappropriate management of saline soils, and the storage of plant and equipment, has potential to impact surrounding land and waterways from off-site leaching of contaminants, or saline soils.

Any exposed soil and any excavations will be backfilled and reinstated.

The proposal does not propose to permanently change the surface topography and drainage patterns of the area. The area will be returned to its original topography and drainage pattern following construction.

Mitigation measures

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

Table 6-1 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 plan (ESCP) in accordance with the 'Blue Book'
- restoration.

The Stockpile Management Plan will be prepared by the Delivery Contractor and approved by the Sydney Water Project Manager in consultation with the Environmental Representative and Contamination and Hazardous Materials team.

Minimise ground disturbance and stabilise disturbed areas progressively.

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

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 Delivery Contractor must ensure the conditions in that Order/Exemption are strictly adhered to.

Stop work in the immediate vicinity of suspected contamination. Indicators of contamination include discoloured soil, anthropogenic fill material, asbestos, strong chemical or petrol odours and leachate. Contain disturbed material on an impermeable surface and cordon areas off. Notify the Sydney Water Project Manager and the Environmental Representative (who 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:

- (if relevant) treating existing salinity with gypsum
- (if relevant) establishing salt tolerant species in existing or potential salinity problem areas after construction
- stabilising existing areas of erosion
- minimising water use on site
- avoiding rotation and vertical displacement of the original soil profile
- backfilling excavations deeper than one metre in the same order, or treating or using this material as fill at depths more than one metre from the finished level.

Erosion and sediment mitigation devices are to be erected in a manner consistent with current best management practice (i.e. Managing Urban Stormwater: Soils and Construction 4th Edition Landcom, 2004) to prevent entry of sediment into the waterway before any earthworks being undertaken. These are to be maintained in good working order for the duration of the works and subsequently until the site has been stabilised and the risk of erosion and sediment movement from the site is minimal.

6.2.2 Water and drainage

Several geotechnical and contamination reports, based on desktop reviews and site studies were completed to inform the proposal design, as listed in section 6.2 of the REF. Details pertaining to water and drainage are summarised below.

Existing environment and potential impacts

Much of the work proposed, including watermain installation and decommissioning of existing assets will take place within the road corridor and previously disturbed ground. Some works are required within Prospect Nature Reserve to enable decommissioning of the old D750 watermain and connecting the new DN900 watermain to the network. The reserve is NPWS land and falls within the Water NSW Prospect Special Area (Schedule 1). Public access is restricted in the Special Area to protect water security. Sydney Water owned land is excluded from the Special Area.

The proposal is near Prospect Reservoir and the small tributaries surrounding the reservoir, which include Girraween Creek immediately east of William Lawson Drive. Prospect Reservoir is mapped as Key Fish Habitat (KFH). At the closest point, the southern end of the proposal along William Lawson Drive is about 160 m east of Prospect Reservoir. No work is proposed within the bank of, or directly within a waterway. During construction poor site management may lead to potential sedimentation impacts on nearby waterways; however, these will be managed by applying mitigation measures (see Table 6-2).

On the completion of works, areas disturbed will be returned to previous conditions. The proposal is not anticipated to change flood patterns or significantly impact surface quality or water flow during construction or operation.

Neutral or beneficial effect

Public authorities undertaking activities in the Sydney Drinking Water Catchment must consider whether those activities will have a Neutral or beneficial effect on water quality (NorBE).

As part of the proposal is in an area administered by Water NSW a NorBE assessment was completed (see Appendix E). This concluded that the proposal would have a neutral effect on water quality in Prospect Reservoir.

Groundwater

Excavation to a depth up to 2.5 m is required to complete the proposal. During early geotechnical investigations groundwater was recorded from boreholes between 3.86 to 4.54 mbgl. Subsequent reporting identified that concentration levels of nickel and zinc in groundwater samples exceeded the adopted ecological and human health investigation levels within the vicinity of William Lawson Drive (adjacent to heritage trees). If dewatering is required during construction, groundwater may present a hazard to sensitive ecological receptors if not adequately managed. Due to the proposed depth of excavation being comparatively shallow, limited groundwater is expected to be encountered during excavation.

At the time of writing, the volume of groundwater required to be extracted is unknown. If groundwater is intercepted during construction activities, and dewatering is required, appropriate approvals must be obtained by Sydney Water prior to groundwater removal. Approvals can take between a minimum of 5 to 12 months to be processed, depending on the application (WSWA or WAL).

No groundwater will be discharged into Prospect Reservoir, or Water NSW land. Any extracted groundwater will be tested prior to being discharged offsite of Water NSW land, or appropriately disposed of, in line with mitigation measures in Table 6-2.

Commissioning

Management of drinking water used for pressure testing and/or disinfection, may be required. This water will be discharged according to Sydney Water's discharge protocols. Given the sensitive nature of the surrounding site, water will be dechlorinated prior to discharge. As with groundwater management, any required dewatering of drinking water will be directed to flow away from NPWS / Water NSW land and Prospect Reservoir. Alternatively, this water would be appropriately disposed of offsite.

Discharge events during the construction and commissioning phase are not anticipated to have a negative impact on surrounding water quality compared to current conditions with the application of mitigation measures (see Table 6-2).

Mitigation measures

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

Table 6-2 Environmental mitigation measures — water and drainage

Mitigation measures
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 away from watercourses or drainage lines.
If the potential for intercepting groundwater is identified after the REF is determined, Sydney Water will obtain a groundwater Water Supply Approval and where dewatering is >3ML per water year (from 1 July) a Water Access Licence from NRAR will also be obtained. The Delivery Contractor is responsible for: • providing expert hydrogeological technical information to obtain the approvals preparing a Dewatering Management Plan • complying with the approval conditions (such as protecting water quality; minimising aquifer extraction volumes, monitoring extraction with flow meters and recording volumes).
Discharge all water in accordance with Sydney Water's Discharge Protocols Standard Operating Procedure (WPIMS5021), including erosion controls, discharge rate, dichlorination where required, and monitoring. Maintain a slow rate of discharge to minimise potential for erosion. Re-use potable / groundwater water where possible. No groundwater will be discharged into Prospect Reservoir, or Water NSW land. Any extracted groundwater will be tested prior to being discharged or disposed of (at an appropriate facility).
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. Bunded areas to have 110% capacity of stored liquid volume. Chemicals and fuels in vehicles must be tightly secured. All chemicals to be clearly labelled.
Conduct 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.

Mitigation measures
Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak-free item.
Comply with the Sydney Water and Water NSW Access Protocol. The contractors will need to adhere to the conditions outlined in the 'Conditions of Access into Special and Controlled Areas' contained in clause 11 of the 'Sydney Water and Water NSW Access Protocol, Version 1' and any other conditions outlined in correspondence from Water NSW. This includes any additional conditions from ongoing consultation with Water NSW.
Comply with the Sydney Water and NPWS Access Protocol.
If changes to the scope or on-ground activities on Water NSW / NPWS land occurs, further consultation with must be undertaken.

6.2.3 Flora and fauna

Existing environment and potential impacts

The proposal overlaps several jurisdictions including Western Parklands City SEPP, Sydney Water land, Water NSW Sydney drinking water catchment special area, NPWS land, and local council managed roadways.

The proposal is also located on land mapped Category 1 and Category 0 bushfire prone land.

Five threatened fauna species and two threatened flora species are recorded within 200 m of the proposal, with sightings predominantly recorded within Prospect Nature Reserve.

- **Flora:** *Pimelea spicata* (Spiked Rice-flower), *Pultenaea parviflora*
- **Fauna:** Cumberland Plain Land Snail, Large Bent-winged Bat, Eastern Coastal Free-tailed Bat, Grey-headed Flying-fox, Swift Parrot.

Threatened bird and bat species are highly mobile and unlikely to be significantly impacted by proposed activities. The habitat of the Cumberland Plain Land Snail includes leaf litter under and around the base of trees. Much of the proposed work will be restricted to the road and road shoulder and will avoid the vegetated areas either side of the roadway. Where activities are proposed outside of the road corridor, work (including access and construction) will predominantly be limited to previously disturbed grassy areas away from the base of nearby vegetation. With the inclusion of mitigation measures outlined below, impacts to threatened species are not anticipated.

Cumberland Shale Plains Woodland, a TEC listed under the EPBC Act, is mapped within Andrew Campbell Reserve and Prospect Nature Reserve, but not within the proposed construction footprint. No impacts to this TEC are required for works to proceed.

The proposal is predominantly located adjacent and outside of NPWS land. However, access to Prospect Nature Reserve, which is National Parks owned land and a Water NSW S1 Special Area, is required to decommission existing assets, and install connections. As per the NPWS Access

Protocol, the proposal consists of Type B activities and the notification process in the NPWS Access Protocol (BMIS0128) has been followed (see Section 4.2).

The presence of *Phytopthora* is suspected within Prospect Nature Reserve (as detailed in the site's property environmental management plant, PEMP). The fungal pathogen invades and destroys the root systems of susceptible plant species and can be spread by activities such as bushwalking, bike riding and bush regeneration. Works within NPWS land will be restricted to the edge of the park, with access via existing gates and fire trails. With the application of mitigation measures in Table 6-3 below, the potential spread and impacts associated with *Phytophthora* will be minimised.

A state heritage listed avenue of pines line William Lawson Drive up to its intersection with Reservoir Road. An arborist assessment and report were commissioned, and the advice incorporated into the project design (Appendix B; refer to Section 6.2.4 below for further discussion).

No direct impact including trimming or removal to these heritage trees is required, and the project has been designed to limit significant impact to these high value trees. Minimal vegetation disturbance is required for the remainder of the proposal, including the removal of two exotic *Jacaranda* sp. trees that are located within the state heritage curtilage. 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. Based on the vegetation to be cleared, a 1:1 offset is required.

Some turf may be removed during construction however this will be reinstated.

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 low.

Table 6-3 Environmental mitigation measures — flora and fauna

Mitigation measures
Offset residual impacts to native vegetation and trees in accordance with the Biodiversity Offset Guideline (SWEMS0019.13). For the current proposal, the impact of residual loss of biodiversity values resulting from works is minor as per the Guideline. The recommended offset ratio for minor impacts to non-native vegetation is 1:1. • The Contractor is to consult with the landowner to determine preferred replanting location.
Undertake re-vegetation in accordance with the Guideline for managing native re-vegetation for construction projects (SWEMS0025.11).
• Minimise vegetation clearance and disturbance. If vegetation is highly sensitive, trimming or clearance cannot proceed without written authorisation from the Sydney Water Project

Mitigation measures
Manager (in consultation with Environmental Representative). Unless specifically stated in this REF: No vegetation trimming or removal is permitted: - no impacts to heritage listed pine trees is allowed, including trimming. - no impacts to vegetation within NPWS land or Water NSW Special Area is allowed, including trimming. The contractor may temporarily tie back vegetation if required for access, removing all ties upon completion.
As per arborist recommendations (Appendix B - Canopy Consulting 2023): • to minimise impacts to one state heritage listed hoop pine (Tree 439) where the indicative encroachment by the works is significant (18.32 %), the Contractor is to carry out soil treatments, including mulching and nutrition amendments that will help promote root growth prior to and during construction. These amendments will promote fine root growth, which is expected to offset the loss of roots that may occur due to construction activities and should begin at least 6 months prior to construction commencing. • removal of the two individual *Jacaranda* sp. (Tree 501 and Tree 502), located at the southern end of the alignment adjacent to William Lawson Drive, is required. As per the Sydney Water Biodiversity Offset Guideline, offset at a 1:1 and in consultation with landowner. Contractor to refer to Appendix B for details.
Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing.
Retain dead tree trunks, bush rock or logs in-situ unless they are in the impact 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.
Adjust methodology (e.g. avoid area, hand excavate, implement exclusion fencing) to protect sensitive areas where possible (such as mature trees, known threatened species, populations or ecological communities).
Inspect vegetation for potential fauna prior to clearing or trimming. If fauna is present, or ecological assessment has determined high likelihood of native fauna presence, including removal of hollow bearing trees, engage a licenced ecologist to inspect and relocate fauna before works.

Mitigation measures
If native fauna is encountered on site, stop work and allow the fauna to move away unharassed. Engage a licenced ecologist if assistance is required to move fauna.
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.
For works in council owned bushland and National Parks the Delivery Contractor will consult with Councils/NPWS to identify known plant pathogens or pests and management requirements.
To prevent spread of weeds (and *Phytopthora*), within Prospect Nature Reserve, workers will spray their boots and vehicle tyres with a mixture or 70% methylated spirits and 30% water when leaving the reserve (NPWS land/ Water NSW area).
If any damage occurs to vegetation outside of the impact area (as to be shown in the CEMP), notify the Sydney Water Project Manager and Environmental Representative so that appropriate remediation strategies can be developed.
Manage biosecurity in accordance with: • *Biosecurity Act 2015* (see NSW Weedwise), including reporting new weed infestations or invasive pests • contemporary bush regeneration practices, including disposal of sealed bagged weeds to a licenced waste disposal facility. Record Pesticides and Herbicides use in accordance with SWEMS00017 where applicable.
In TOBAN period: For maintenance and construction activities that are not essential/emergency works, the use of fire in the open, including for general purpose hot works must not proceed without an exemption being approved. Staff and contractors should use the Sydney Water Total Fire Ban Exemption Framework to determine exemption permissibility and approval pathway.
Comply with the Sydney Water and Water NSW Access Protocol. The contractors will need to adhere to the conditions outlined in the 'Conditions of Access into Special and Controlled Areas' contained in clause 11 of the 'Sydney Water and Water NSW Access Protocol, Version 1' and any other conditions outlined in correspondence from Water NSW. This includes any additional conditions from ongoing consultation with Water NSW.
Comply with the Sydney Water and NPWS Access Protocol.

Mitigation measures

If changes to the scope or on-ground activities on Water NSW / NPWS land occurs, further consultation with must be undertaken.

6.2.4 Heritage

Aboriginal heritage

Existing environment and potential impacts

An AHIMS basic search was conducted 17 September 2024, identifying twelve registered site cards in the general area and five registered sites within 200 m of the proposal (Figure 3-2, Table 6-4, Appendices F and G). A subsequent, project-specific, Aboriginal Heritage Due Diligence (AHDD) was completed in December 2024 and is provided as Appendix F. Site cards, a previous AHDD assessment for the Prospect Reservoir area (Aecom, 2020), and two draft conservation management plans for the Prospect Reservoir and Veteran Hall Archaeological Site, were reviewed and incorporated into Appendix G, to understand the site and potential construction impacts to Aboriginal heritage. Results of this assessment are summarised below.

The works are in a high-risk landscape for Aboriginal Heritage (< 200 m from waters).

The proposal is generally located within previously disturbed environments such as road corridors, areas where other utilities have been installed and areas that have been cleared of vegetation and historically farmed. Past recorded land uses with the Prospect Reservoir area, causing ground disturbances include:

- large scale vegetation clearance, particularly associated with the early land grant
- use of the land for agricultural purposes such as grazing
- large scale earthworks for the construction and maintenance of the reservoir
- environmental impacts such as fire and flooding
- historical military use.

These disturbances, most of which would have occurred during the post-contact (European arrival) period, are likely to have impacted and altered Aboriginal archaeological sites in the region through either the removal and/or redeposition of sites. Additionally, changes to landscape use are likely to have caused an increase in erosion.

[redacted] *This information has been redacted to protect sensitive Aboriginal heritage information.* [redacted] In recent assessments (see Appendix G) areas of Aboriginal archaeological potential were identified and are shown in Figure 6-1 and will be considered no-go zones for the current project. [redacted] Nonetheless, the current proposal is located predominantly within cleared, open grassy areas, or the roadway and are outside mapped areas of Aboriginal archaeological potential.

Figure 6-1 Areas of Aboriginal archaeological potential (Extent Heritage 2024a – Appendix G).

There is the potential that construction activities will be to depths below that affected by past disturbances, including the existing below ground services and surface infrastructure. Thus, there will be impacts to undisturbed ground. Given the known location and types of Aboriginal archaeology within the area, however, impacts are not expected. Generally, the Aboriginal archaeology, [redacted] would have been disturbed by the creation of existing infrastructure.

Based on the list below, the proposal confers a low risk of accidental harm to potential Aboriginal objects within the construction corridor when applying mitigation measures in Table 6-5:

- review of registered Aboriginal sites within 200 m of the proposal (Table 6-4)
- recent reporting of Aboriginal archaeological potential in Prospect Reservoir and surrounds and Veteran Hall areas (Figure 6-1, Appendices G and H)
- project location and proposed activities (see Section 3 for details).

Works should proceed with caution and mitigation measures strictly adhered to.

Table 6-4 Summary of registered Aboriginal sites within 200 m of the proposal.

Site card	Description
45-5-2894	[redacted] This information has been redacted to protect sensitive Aboriginal heritage information. [redacted]

Site card	Description
	[redacted]
45-5-2893	[redacted]
45-5-2892	[redacted] *This information has been redacted to protect sensitive Aboriginal heritage information.*
45-5-2891	[redacted]
45-5-2548	[redacted]

Non-Aboriginal heritage

Existing environment and potential impacts

The proposal is partially within Prospect Reservoir, which is a State-significant item listed on the Section 170 Sydney Water Heritage Register, State Heritage Register, and local heritage register (under Western Parklands City SEPP). Conservation and management of Prospect Reservoir and Surrounding Area is guided by the Prospect Reservoir Site Conservation Management Plan (CMP). The first Prospect Reservoir site CMP was prepared by Sydney Water in 2005 and endorsed by the NSW Heritage Council in 2006 for a period of five years, which has now lapsed. A second CMP was prepared by the Government Architect's Office on behalf of the Sydney Catchment Authority (now Water NSW) in 2012, however this is yet to be endorsed by the NSW Heritage Council. Recently, Sydney Water has commissioned two CMPs for the area, currently in

draft (see Appendix G). The proposal also partially overlaps Reservoir Road, a State-significant item listed on the State Heritage Register and local heritage register (under the Blacktown LEP 2015). Heritage listing details are as follows:

- State Heritage Register (SHR) SHR#01370 Prospect Reservoir and Surrounding Area
- Section 170 Sydney Water Heritage Register ID 4575804 Prospect Reservoir
- Western Precincts SEPP item 4 – Prospect Reservoir and Surrounding Area
- State Heritage Register (SHR) SHR#01911 Former Great Western Road, Prospect
- Blacktown LEP 2015 – Great Western Highway (former alignment) ID I60.

Statement of Heritage Impact (SoHI) - Summary

A SoHI was completed to assess potential impacts to the two State-significant items and included consideration of available CMPs.

The SoHI notes the proposal is situated adjacent to two other items of State heritage significance, the Royal Cricketers Arms Inn (SHR#00660) and Veteran Hall – House Remains (SHR#1351). The report concluded that the proposed construction works have the potential to cause an adverse impact to archaeological deposits associated with the Former Great Western Road and possibly with the 1820s Barn associated with Veteran Hall, which is located within the listed curtilage for Prospect Reservoir and Surrounding Area. The following recommendations were made:

- **Recommendation 1:** An application should be made for a Section 60 (s60) permit for impacts to the listed items Former Great Western Road and Prospect Reservoir and Surrounding Areas.
- **Recommendation 2:** Given the State heritage significance of Prospect Reservoir and Surrounding Area, the Former Great Western Road, the Royal Cricketers Arms and Veteran Hall – House Remains, it is recommended that the heritage restrictions and responsibilities under the *Heritage Act 1977* form part of the induction for all employees, contractors and subcontractors involved in the proposed works, with particular attention paid to s57(1) of the *Heritage Act 1977*.
- **Recommendation 3:** If unexpected historic finds are identified during construction, Sydney Water's unexpected finds procedure should be followed. The unexpected finds procedure should be included in the CEMP for the project.

s.60 application and approval conditions

As per SoHI recommendations, Sydney Water submitted an s.60 application to Heritage NSW on 13th December 2024. A subsequent archaeological assessment was completed as an addendum to the SoHI in response to Heritage NSW request for further information. Heritage NSW granted approval to the s.60 application, subject to the sixteen conditions outlined in Application ID 7342 (see Appendix C for approval and associated reports).

Note, this approval is based on the project design plans for which this REF is based on and was submitted at the time of the s.60 application (see Appendix C – Heritage NSW approved plans).

A summary of the archaeological assessment, including additional recommendations to apply to the project, follows below.

Archeological assessment (addendum to SoHI) – summary

The archaeological assessment was in response to Heritage NSW's request for further information in support of Sydney Water's application for a s.60 works approval under ID 7342. The SoHI and archaeological assessment should be read in conjunction, and conditions of the approval applied (Appendix C).

Proposed impacts from the project to Reservoir Road fall partially within the curtilage of the State heritage listed Former Great Western Road (SHR#01911). While the archaeological character and potential for impact was canvassed in the SoHI (see in particular Section 6.2.2 of that report), the subsequent archaeological assessment sought to expand on those findings, to assess the potential:

- for archaeological deposits to be encountered
- significance of any such deposits
- for impact on such deposits and appropriate management measures.

As indicated in the SHR listing, there is archaeological potential associated with the Former Great Western Road based on the premise that as its alignment has not substantially changed since construction in c. 1816, then there is a possibility that intact archaeological deposits have been retained. These potential archaeological deposits relate to former road surfaces and possibly relics associated with the construction. The expected former road surfaces of the Former Great Western Road at Prospect are:

- compressed earth (potentially with dolerite paving) (1816-1860s)
- metalled (crushed rock/gravel) (1860s-c.1930s)
- bitumen/asphalt (c.1930s – 2025).

In addition to the former road surfaces, other road infrastructure may also be present, such as boundary stones, culverts or drains. Sporadic relics may also be present within the study area relating to road building and road users. These relics may date from 1816 onwards, given the historical repairs to and use of the road from that year onwards. Previous disturbance of the area for construction of the existing roadway and other existing services may have caused additional damage to or destroyed archaeological remains of the former historic roadway. Whilst it is difficult to confirm without further investigation, the design of the proposal assessed in the current REF has positioned construction activities in the existing road shoulder or the grassed area adjacent to the roadway.

The addendum concludes that although the proposed works will impact the Former Great Western Road, sufficient evidence exists that much of the earlier road surfaces may have been removed by previous road works or the installation of services. It is therefore proposed that in the first instance, monitoring of earthworks by a qualified and experienced archaeologist is the most appropriate management measure, with archaeological excavation only to be triggered should historically significant former road surfaces and/or associated relics be identified. All activities should proceed following the sixteen conditions outlined in the s.60 approval and apply the mitigation measures in Table 6-5.

State significant avenue of pines

The proposal, which is situated mostly within the road corridor, passes between an avenue of pines that line William Lawson Drive up to its intersection with Reservoir Road. These pines form part of the state heritage listing of the Prospect Reservoir area (Figure 6-2). In addition to the SoHI, an arborist report was completed to assess potential construction impacts to these state heritage items (see Appendix B). No direct impact including trimming or removal to these heritage trees is required or endorsed.

Figure 6-2 Looking south, State heritage listed Hoop Pines along William Lawson Drive (Extent Heritage 2024a, Appendix G).

In line with arborist recommendations outlined in Appendix B, the proposal has been designed to ensure ground activities will remain outside the tree protection zone (TPZ) where possible to minimise root damage and ensure no more than 10% encroachment into TPZ under any circumstances. To ensure continued tree health where encroachment greater than 10% is unavoidable, mitigation measures in Table 6-5 apply.

Minimal vegetation disturbance is required for the remainder of the proposal, including the removal of two exotic *Jacaranda* sp. trees, which are located along William Lawson Drive and are located with the state heritage curtilage of Prospect Reservoir (designated tree 501 and 502, see Figures 6-3 to 6-5, and Appendix B). Removal of these two individual trees follows the arborist recommendation and is required to avoid potential hazards associated with declining tree health. Declining tree health may arise due to potential excessive root impacts where the proposal alignment could not be moved to avoid encroachment into the TPZ. These exotic trees have also been assessed as having a low heritage value (P. Bennett, Sydney Water Lead Heritage Advisor, 13 December 2023; for SoHI, see Appendix C). No impacts are anticipated during operation.

Figure 6-3 Aerial imagery showing current condition and approximate location of Tree 501 and Tree 502 (Appendix B; refer below to Figure 6-4).

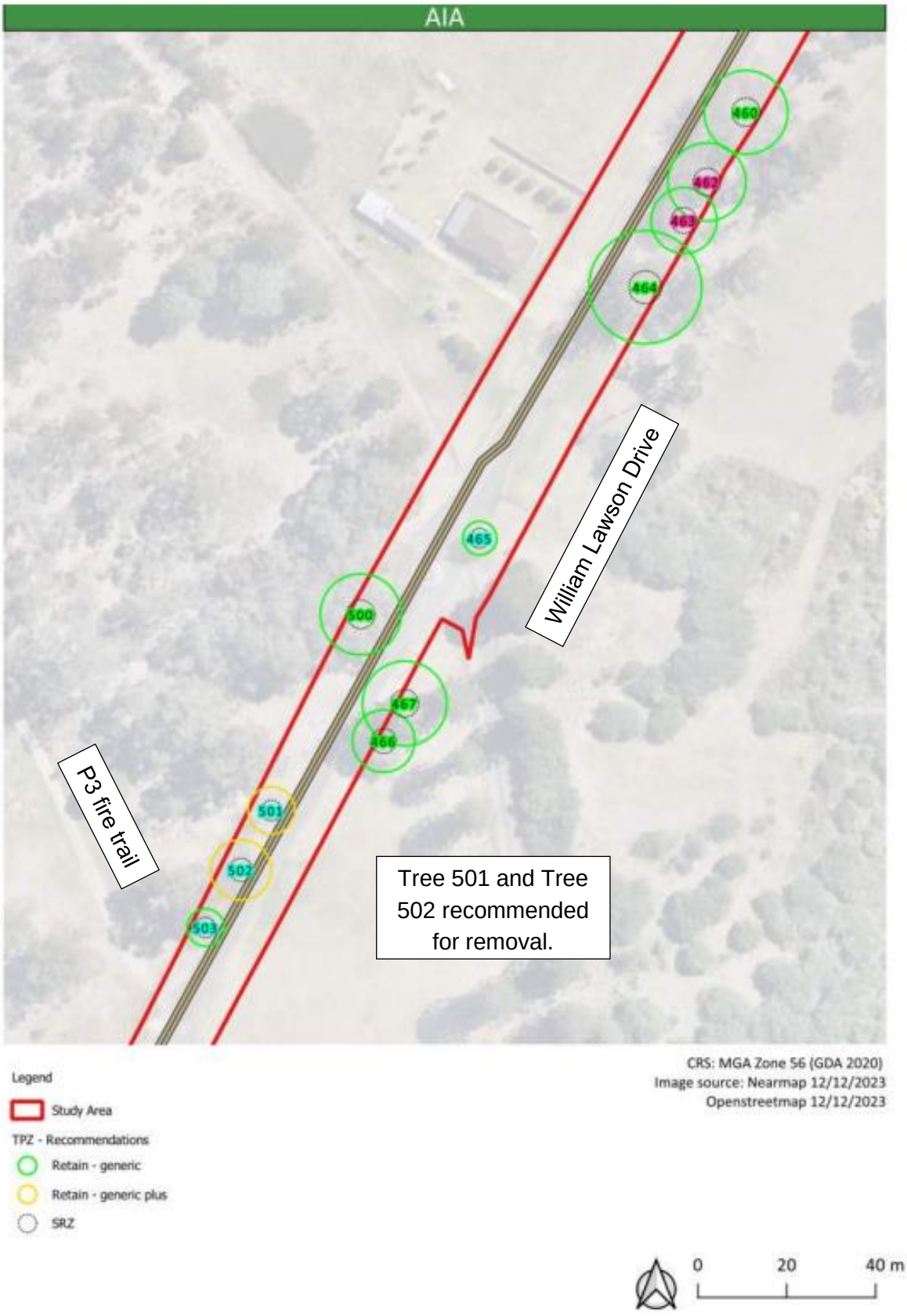

Figure 6-4 Tree 501 and Tree 502, located along William Lawson Drive (from Appendix B).

Mitigation measures

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

Table 6-5 Environmental mitigation measures — heritage

Mitigation measures
If any Aboriginal object or non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify Sydney Water Project Manager in accordance with SWEMS0009.
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.
All site personnel must be inducted by a heritage significance of the area before starting work on site. The induction should include clear explanation of heritage constraints, go and no-go areas, measures to avoid impacts, stop work procedures, and contact details to obtain further heritage guidance if needed.
Apply recommendations and conditions as outlined in the 2024 SoHI, 2025 archaeological assessment (SoHI addendum), and s.60 approval (HMS Application ID: 7342), which are provided in Appendix C, including: • Heritage restrictions and responsibilities under the *Heritage Act 1977* must form part of the induction for all employees, contractors and subcontractors involved in the proposed works, with particular attention paid to **s57(1)** of the *Heritage Act 1977*. • If unexpected historic finds are identified during construction, Sydney Water's unexpected finds procedure should be followed. The **unexpected finds procedure** should be included in the Construction Environmental Management Plan (CEMP) for the project. • Monitoring of earthworks to be undertaken by a qualified and experienced archaeologist. - Should the earthworks reveal evidence of former road surfaces, infrastructure or relics associated with the Former Great Western Road, all work should stop, and the archaeological methodology outlined in Section 6.0 of this addendum should be followed. - The monitoring and stop work procedures should also be included in the Construction Environmental Management Plan (CEMP) for the project.

6.2.5 Noise and vibration

Existing environment

The land uses surrounding the proposal site include non-residential land uses and industrial land, recreational uses (e.g. Raging Waters Sydney), small businesses (e.g. Royal Cricketers Arms), religious centres (e.g. St Mark's Coptic Catholic Church Prospect), local childcare (Berry Patch Preschool and Long Day Care Centre) and disability facilities (Pecky's Disability Service) (Figures 3-2, 6-6, and 6-7). There are limited residential properties within range of the proposal, with those nearest located adjacent to Reservoir Road.

Most of the land immediately surrounding the proposal site located along William Lawson Drive is owned by Sydney Water and consists of the publicly accessible Andrew Campbell Reserve and includes playgrounds, picnic tables, barbecues, and toilet blocks. The remainder of the proposal is located within the road corridor of Reservoir Road, except for the southern and northern ends of the proposal which are located within Prospect Nature Reserve (being a NPWS / Water NSW Special Area). The area of land surrounding Prospect Reservoir and mapped as NPWS and Water NSW is not publicly accessible.

Equipment and timing of works

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

- excavators (up to 30T excavator with hammer, if required)
- roller (up to 4 tonne)
- mechanical root cutter (if required)
- chainsaw and mulcher (if required)
- power tools such as concrete saw, rock hammers/jackhammers, pavement saws, grinders, and compactors
- air compressors
- generators (5 kV diesel)
- light and heavy vehicles movements.

Most work and deliveries would be scheduled to occur during standard daytime hours during the working week:

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

The proposal may require work outside these hours, for safety and/or to reduce impacts (e.g. traffic) at different times (e.g. for work in roads or delivery of oversize equipment), or as a requirement of a road occupancy licence (ROL).

The proposal is expected to take up to 12 months to construct, with much of the work set back from potential receivers or businesses and within the road corridor, particularly along William Lawson Drive. Therefore, only a limited number of receivers would be affected for extended periods of time. There are also options for noise containment including the use of noise blankets.

Noise impacts - construction

The likelihood of noise impact was assessed using Table 2 of the Draft Construction Noise Guideline (EPA 2020). The review indicated that the likelihood of noise impact to be low-medium risk and therefore a qualitative noise impact assessment was undertaken. Subsequently, a noise impact assessment was completed using the Transport for NSW (TfNSW) Construction and Maintenance noise estimator tool (TfNSW 2022).

A worst-case distance-based scenario (drainage infrastructure) was applied for the proposal, due to the method of construction being open trenching for installation and decommissioning of water pipes. Day and night scenarios were assessed, due to potential for work to be required outside of standard operating hours, in response to ROL requirements and for safety.

Although works are expected to take up to 12 months to complete, it is expected that activities would move along the alignment and therefore only temporarily impact on sensitive receivers. Similarly, noisiest equipment will not be used all shift, every shift during the day or night and so the result of the assessment represents a conservative estimate.

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

The worst-case scenario assessment criteria applied are summarised below:

- Distance-based (scenario): drainage infrastructure:
    - the description of this activity includes excavation of trenches and pits, delivery and placement of precast pipes and pits, filling and backfilling
    - typical equipment captured by this scenario includes backhoe, franna crane (20T) excavator (tracked, 35T), concrete truck, truck compressor, vibratory roller, road truck.
- The noise area category R2 was chosen for both day and night work because:
    - background noise is influenced by distant road traffic noise and small volumes of traffic from local roads
    - the surrounding area is predominantly a semi-industrial setting, with limited residential receivers.
- Receiver: developed settlements (urban and suburban), including:

- an assessment of day activities and out of hours (night) activities.

- Line of sight considerations:
  - (clear) line of sight – straight line between the noise source and the receiver is unhindered
  - no line of sight (behind solid barrier) – includes shielding barriers and existing infrastructure (e.g. rows of housing).

Based on the above criteria, the predicted worst-case noise impacts for sensitive receivers associated proposed construction activities during day and night work are summarised in Table 6-6 to Table 6-8, and Figure 6-5 to Figure 6-6. These outputs include recommended mitigation measures at different distances from sensitive receivers, as identified by the noise estimator tool (refer to Appendix H). These are to be considered by the community team and offered where appropriate.

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

During operation, the alignment will be beneath the ground and no noise or vibrational impacts are anticipated. Minor noise may be generated during operational maintenance activities. These would generally be of short duration and mitigated through application of standard mitigation measures.

Table 6-6 Background noise levels and noise management levels (TfNSW 2022).

	Noise area category	R2
RBL or LA_{90}[1] Background level (dB(A))	Day	45
	Evening	40
	Night	35
LAeq(15minute) Noise Management Level[2] (dB(A))	Day	55
	Day (OOHW)	50
	Evening	45
	Night	40

Notes: [1]LA_{90} = Background noise level
[2]*Noise Management Level for works during standard hours = Background level plus 10dB(A)*
Noise Management Level (NML) for out of hours works = Background level plus 5dB(A).

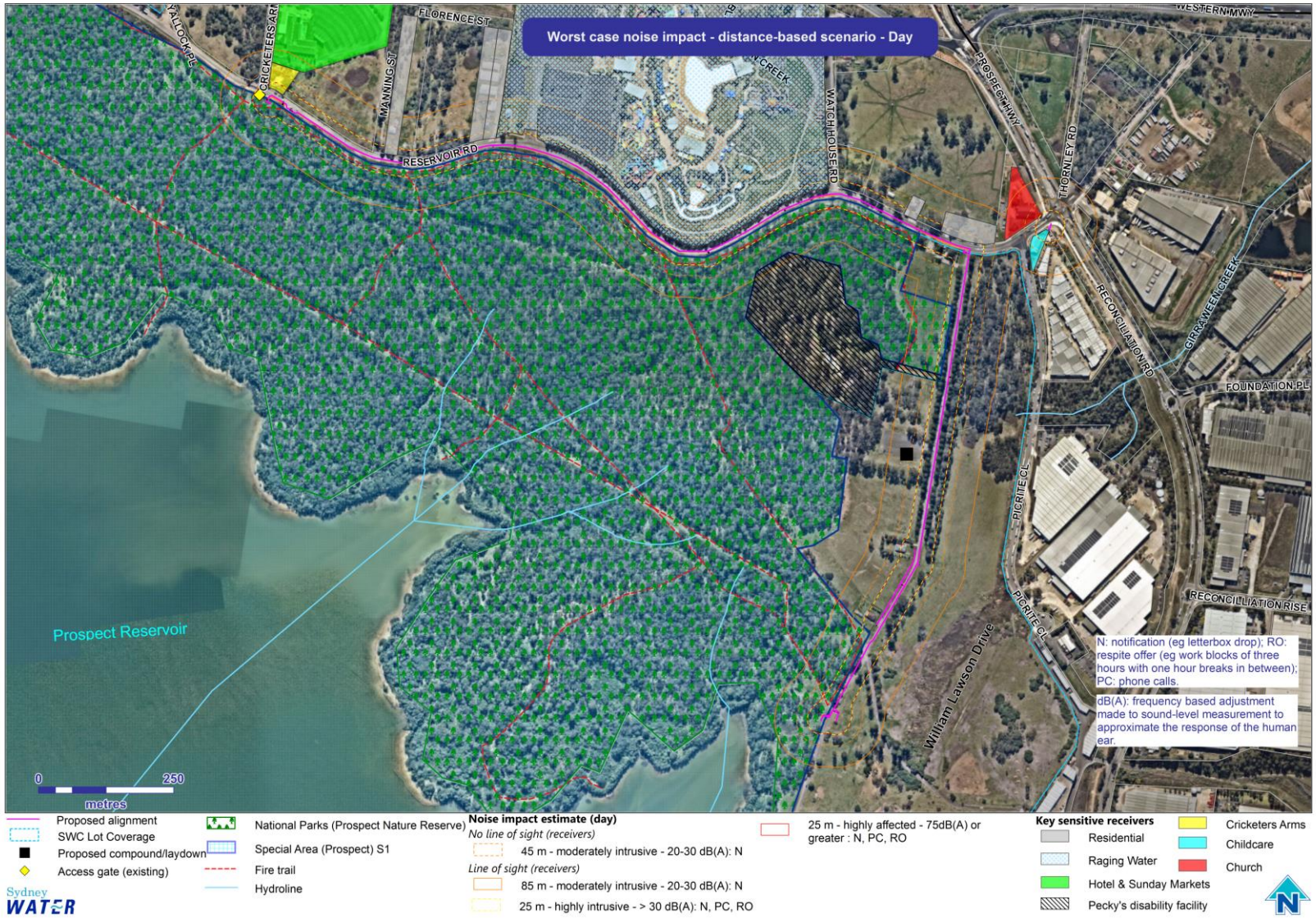

Figure 6-5 Day noise impacts and key sensitive receivers

Figure 6-6 Night noise impacts and key sensitive receivers

Table 6-7 Affected distance (metres) for sensitive receivers (day) – distanced-based scenario in a developed area

Receivers	LAeq(15minute) noise level above background (LA90)		
	20 to 30 dB(A)	> 30 dB(A)	LAeq(15minute) 75dB or greater
	Moderately intrusive	Highly intrusive	Highly affected
Developed: Line of sight	85	25	25
Developed: No line of sight	45	15	15
Recommended additional mitigation measures (refer Appendix H for further details)	Notification (N)	Notification (N) Phone Call (PC) Respite Offer (RO)	N Phone Call (PC) Respite Offer (RO)

Table 6-8 Affected distance (metres) for sensitive receivers (night) – distanced-based scenario

Activities	LAeq(15minute) noise level above background (LA90)				
	5 to 10 dB(A)	10 to 20 dB(A)	20 to 30 dB(A)	> 30 dB(A)	LAeq(15minute) 75dB or greater
	Noticeable	Clearly audible	Moderately intrusive	Highly intrusive	Highly affected
Developed: Line of sight	740	500	215	85	25
Developed: No line of sight	500	330	140	45	15
Recommended additional mitigation measures (refer Appendix H for further details)	Notification (N)	N Respite Period 2 (R2) Duration Respite (DR)	N, R2, DR Specific Notification (SN) Phone Call (PC)	N, R2, DR, SN, PC Alternative Accommodation (AA)	N, PC Respite Offer (RO)

Vibration impacts – construction

The proposal will generate vibration during operation. The noise estimator includes some indicative minimum working distances for different vibratory plant and equipment, and further guidance can be found in the EPAs 2006 technical guidelines (Assessing vibrations: a technical guideline). These distances will vary depending on the item of plant, local geotechnical conditions, and the frequency of vibration. However, where works are performed within the minimum working distances of a structure, structural damage may occur, and additional mitigation measures are recommended.

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

- small (5 to 12 tonne) hydraulic hammer
  - minimum working distance of 2 m (light framed structures cosmetic damage)
  - minimum working distance of 7 m (human response/comfort).
- medium (12 to 18 tonne) hydraulic hammer – minimum working distance of 7 m
  - minimum working distance of 7 m (light framed structures cosmetic damage)
  - minimum working distance of 23 m (human response/comfort).
- large (18 to 34 tonne) hydraulic hammer – minimum working distance of 22 m
  - minimum working distance of 22 m (light framed structures cosmetic damage)
  - minimum working distance of 73 m (human response/comfort).
- vibratory roller (2 – 4 tonne)
  - minimum working distance of 6 m (light framed structures cosmetic damage)
  - minimum working distance of 20 m (human response/comfort).

There is potential that some nearby buildings may be impacted by vibration, particularly when using the excavator with hammer. Consideration should also be made to human comfort levels, and efforts made to minimise vibration inducing activities proposed adjacent to the childcare facility, church, and the few residential properties located along Reservoir Road. In relation to human comfort, the above minimum working distances relate to continuous vibrations; however, during construction vibration emissions are expected to be intermittent in nature. Applying the correct plant for minimum distances as listed above, and the mitigation measures below, significant vibration impacts are unlikely.

During operation, the alignment will be beneath the ground and no noise or vibrational impacts are anticipated. Noise and/or minor vibrations may be generated during operational maintenance activities. These would generally be of short duration, usually within standard working hours, and mitigated through application of standard mitigation measures.

While the works would elevate the background noise environment and have some vibration impacts during the construction period, mitigation measures would be implemented to minimise and manage the impacts to sensitive receivers. The recommended mitigation measures at different

distances, from the Transport for NSW Construction Noise Estimator Tool, and guidance found in the EPAs 2006 technical guidelines, are to be considered by the contractor and offered where appropriate.

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 low.

Table 6-9 Environmental mitigation measures — noise and vibration

Mitigation measures
Works must comply with the Interim Construction Noise Guideline (DECC 2009), including schedule work and deliveries during standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturday. No work to be scheduled on Sundays or public holidays. The Proposal will also be carried out in accordance with: • Sydney Water's Noise Management Procedure SWEMS0056 • Noise Policy for Industry (EPA, 2017). All reasonable and feasible noise mitigation measures should be justified, documented and implemented on-site to mitigate noise impacts. All community notification will begin prior to work commencing on site.

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

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

Mitigation measures

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

- justify the need for night works
- consider potential noise impacts and implement the relevant standard daytime and out of hours safeguards and other reasonable and feasible management measures
- identify community notification requirements (i.e. for scheduled night work (not emergency works)),
- notify all potentially impacted residents and sensitive noise receivers not less than one week prior to commencing night work.
- seek approval from the Sydney Water Project Manager in consultation with Sydney Water's Environment and communications representatives.

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

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

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

6.2.6 Air and energy

Existing environment and potential impacts

Air quality of the surrounding area is influenced by nearby industry and vehicle movements along local roadways. There are no properties listed on the National Pollutant Inventory within 1 km of the reserve.

Sensitive receivers located within 50 m of the proposal include:

- Raging Waters Sydney
- Royal Cricketers Arms
- Berry Patch Preschool and Long Day Care Centre
- Prospect Nature Reserve (NPWS)
- Water NSW Special Area (Schedule 1).

There is potential for minor, localised air quality impacts during construction from:

- dust generated during general construction and excavation
- dust generated by construction vehicles travelling on roads and tracks
- dust generated during trenching activities

- emissions from machinery, equipment and vehicles.

During operation, there will not be changes to background odour at nearby receivers. Operational impacts on air quality because of the proposal are expected to be negligible.

Energy use during construction of the proposal would primarily involve the use of fuels to power plant and equipment and is not expected to be different to similar scale construction projects.

Mitigation measures

Impacts on air quality and energy are expected to be temporary and would be minimised by implementing the measures below.

Table 6-10 Environmental mitigation measures — air and energy

Mitigation measures
Use alternatives to fossil fuels where practical and cost-effective.
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.

6.2.7 Waste and hazardous materials

Several geotechnical and contamination reports, based on desktop reviews and site studies were completed to inform the proposal design, as listed in Section 6.2 of the REF. Details pertaining to waste and hazardous materials are summarised below.

Existing environment and potential environmental impacts

Our corporate objectives include a directive to be a resource recovery business with an increasing portfolio of circular economy products and services. This includes reducing waste through recycling and re-use and encouraging our suppliers to minimise waste.

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

- general construction waste such as excess concrete, redundant pieces of pipe/fittings

- broken bricks, timber, paper, plastic and metal
- green waste from clearing vegetation including weeds
- domestic waste including food scraps, aluminium cans, glass bottles, plastic and paper containers, and putrescible waste generated by site construction personnel
- wastewater and grey water from temporary amenities
- spoil that is not suitable for backfilling, from trenching and other excavations
- groundwater dewatered from excavations.

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

If re-use opportunities cannot be identified, or the spoil is unsuitable for re-use due to its geotechnical or contamination characteristics (including asbestos), spoil would be tested and classified according to the Waste Classification Guidelines (NSW EPA, 2014) and disposed of at an appropriately licensed facility.

General workforce waste including food packaging will be generated in minor quantities and will be classified as putrescible or non-putrescible general solid waste. Opportunities to reduce, recycle and reuse on this project would be sought with the Contractor and documented in the Waste Management Plan or CEMP.

There are three contaminated sites reported to the EPA within the study area which are located within Andrew Campbell Reserve.

- Gatehouse, 544 Reservoir Road
- Cottage 3, William Lawson Drive
- Pincott's Cottage, Gate C1.

Each of these sites also have Contaminated Land Management Plans (CLMPs). CLMPs note the presence of lead and/or asbestos-containing material (ACM) is present in surface soils across these three sites. Illegal dumping has also been known to occur within the wider reservoir site. Historic illegal dumping may further cause localised surface contamination.

During recent contamination assessments, no asbestos was detected in those samples taken for analysis along the proposed alignment. In contrast, concentrations of heavy metals and Benzo(a)pyrene were found in several soil samples along the proposed alignment. However, further assessment found that it was unlikely that the levels observed would pose an unacceptable ecological risk, and all samples were assigned General Solid Waste Classification.

As discussed above (see, Section 6.2.2 – water and drainage), concentration levels of nickel and zinc in groundwater samples exceeded the adopted ecological and human health investigation levels. Whilst this presents a potential hazard to sensitive ecological receptors, the risk is considered low as the proposed depth of excavation is comparatively shallow compared to

recorded groundwater levels. If dewatering is required, potential risks will be managed with mitigation measures, which are detailed in Table 6-2 and Table 6-11, and include:

- dechlorinate drinking water used during commission testing prior to discharge
- any groundwater extracted will be tested prior to being discharged or appropriately disposed of offsite
- where water quality is confirmed to meet discharge requirements, discharged water (drinking or ground) will be directed to flow away from NPWS / Water NSW land and Prospect Reservoir and follow Sydney Water discharge guidelines.

Should the works reveal asbestos or any other hazardous or contaminated material, it will be managed through an unexpected finds procedure.

Operational impacts

Operation of the proposal may generate minor volumes of waste during maintenance activities. Any water discharged would be in accordance with Sydney Water's Discharge Protocols Standard Operating Procedure. Any operational wastes generated during maintenance would be managed and disposed of in accordance with Sydney Water's standard operating procedures and disposed of at an appropriately licensed waste disposal or recycling facility.

Mitigation measures

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

Table 6-11 Environmental mitigation measures — waste and hazardous materials

Mitigation measures
Manage waste in accordance with relevant legislation and maintain records to show compliance e.g. waste register, transport and disposal records. Record and submit SWEMS0015.27 Contractor Waste Report.
Provide adequate bins for general waste, hazardous waste and recyclable materials.
Minimise the generation of waste, sort waste streams to maximise reuse/recycling in accordance with the *Waste Avoidance and Resource Recovery Act 2001*.
Manage waste and excess spoil in accordance with the NSW EPA Waste Classification Guidelines. Dispose wastes at an appropriately licenced facility.
Prevent pollutants from escaping including covering skip bins.
Dispose excess vegetation (non-weed) that cannot be used for site stabilisation at an appropriate green waste disposal facility.
Minimise stockpile size and ensure delineation between different stockpiled materials.

Mitigation measures

If fibro or other asbestos containing material is identified, restrict access and follow Sydney Water's Asbestos Management – Minor Works procedure, Document Number 746607. Contact Sydney Water Project Manager who will consult with the Contamination and Hazardous Building Materials team propertyenvironmental@sydneywater.com.au

6.2.8 Traffic and access

Existing environment

The proposal is located on Sydney Water owned land, within a local road corridor, and partially within NPWS land (Prospect Nature Reserve). The reserve area is also a Water NSW Special Area with the Sydney Water drinking water catchment area.

Most of the proposal can be accessed via the local road network, with entry points to NPWS land including an existing gate and fire trail. Gated access to the northern extent of the project is located opposite to the Cricketers Arms Hotel off Reservoir Road. The southern extent of the proposal can be accessed via an existing fire trail (P3 Fire Trail) off William Lawson Drive.

Traversal by plant or contractors over previously cleared, grassy areas, may be required to complete works and would be limited to the proposed 20 m wide construction corridor. New access tracks are not proposed, and vegetation within NPWS land will not be impacted to allow access (including trimming and removal). To minimise disturbance through NPWS land, the contractor will restrict traversal of vehicles and plant to a single route for the duration of the proposal and the site will be reinstated to previous conditions or better in consultation with the landowners upon completion of the proposal.

Potential impacts - construction

During construction, there will likely be minor and temporary impacts to traffic along local roads and the established fire trails within the reserve, as required. Trucks and other plant would be parked as near to the work site as practicable and within the proposed 20 m construction corridor, either on a local road where parking is permitted or within cleared areas on existing tracks, or the proposed compound area within Andrew Campbell Reserve.

Partial road closure along Reservoir Road, to create a one-way direction for the duration of works, is proposed. For William Lawson Drive, which is located within Sydney Water land, full road closure is proposed, and a detour will be in place if required for the duration of works.

Vehicle movements during construction would generally be at the start and end of each shift, with occasional deliveries occurring throughout the duration of works. There would also be heavy vehicle movements to transport spoil and other materials off site for reuse or disposal. Although effort will be made to complete works within standard operating hours, the proposal may require work outside these hours, for safety and/or to reduce impacts (e.g. traffic) at different times (e.g. for work in roads or delivery of oversize equipment), or as a requirement of a road occupancy licence (ROL). Sydney Water will consult with Council and TfNSW as required by the TISEPP to obtain any ROLs required prior to road closures and out of hours work.

The proposed works will require access to land within National Parks to decommission an existing asset and install new connections to the proposed water main that is located outside of NPWS land, within William Lawson Drive and Reservoir Road. These activities may temporarily:

- interrupt access for NPWS/ Water NSW staff to existing fire trails and unsealed access tracks within their land off William Lawson Drive and Reservoir Road
- affect recreational access by the public to facilities including picnic areas and carpark located along William Lawson Drive, building driveways
- cause minor and temporary impacts to traffic flow along roadways.

Adequate consultation with the relevant land holders, including appropriate notification, will be undertaken to reduce project impacts. NPWS and Water NSW were consulted as per the relevant protocols, with works assessed as Type B activities (see Section 4.2 for consultation details). The contractor should continue to liaise with NPWS / Water NSW during construction.

Potential impacts - operation

Impacts during operation are expected to be minimal and limited to regular maintenance movements.

Mitigation measures

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

Table 6-12 Environmental mitigation measures — traffic and access

Mitigation measures
Prepare a Traffic Management Plan (TMP) in consultation with the relevant traffic authority. Meet NSW Roads and Maritime Service's Traffic Control at Worksites Manual v5 requirements for TfNSW roads. The Contractor will obtain a Road Occupancy Licence (ROL) from TfNSW, including if works are within: • 100m of traffic signals when construction commences • 100 m of an TfNSW (State) road.
Minimise traffic impacts near residential properties, schools and businesses by consulting with them (e.g. no major materials deliveries at school / daycare 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.
New access tracks have not been proposed; however, vehicle movement across cleared open grassed areas is required. To minimise disturbance through NPWS land, the contractor will restrict traversal of vehicles and plant to the construction corridor for the duration of the proposal and the site will be reinstated to previous conditions or better upon completion of the proposal.
Comply with the Sydney Water and Water NSW Access Protocol. The contractors will need to adhere to the conditions outlined in the 'Conditions of Access into Special and Controlled Areas' contained in clause 11 of the 'Sydney Water and Water NSW Access Protocol, Version 1' and any other conditions outlined in correspondence from Water NSW. This includes any additional conditions from ongoing consultation with Water NSW.
Water NSW will be notified of the works prior to commencement via the lodgement of the Joint Access Protocol Notification Form. Water NSW has advised that access approval will be considered at time of lodgement of the notification. As part of the submission of the Access Protocol Notification form, Water NSW requires attachment of NPWS response to the proposal, and determined REF.
Comply with the Sydney Water and NPWS Access Protocol.
If changes to the scope or on-ground activities on Water NSW / NPWS land occurs, further consultation with must be undertaken.

6.2.9 Social and visual

Existing environment and potential impacts

Land use surrounding the proposal site include non-residential land uses and industrial land, recreational uses (e.g. Raging Waters Sydney), small businesses (e.g. Royal Cricketers Arms), religious centres (e.g. St Mark's Coptic Catholic Church Prospect), local childcare (i.e. Berry Patch Preschool and Long Day Care Centre) and disability facilities (e.g. Pecky's Disability Service) (refer to Figure 3-2 and Section 6.2.5). There are limited residential properties within range of the proposal, with those nearest located adjacent to Reservoir Road.

Most of the land immediately surrounding the proposal site located along William Lawson Drive is owned by Sydney Water. The remainder of the proposal is located within the road corridor of Reservoir Road, except for the southern and northern ends of the proposal which are located within Prospect Nature Reserve (NPWS / Water NSW).

The area of land surrounding Prospect Reservoir and mapped as NPWS/ Water NSW and is not publicly accessible. Publicly accessible sites within the study area are Reservoir Road and Sydney Water's land, including Andrew Campbell Reserve.

Construction compounds and offices may be visible to members of the public within the portions of the study area that are accessible to the public, including the compound proposed to be located at the carpark within Andrew Campbell Reserve, and works along William Lawson Drive and Reservoir Road. There is the potential for minor disruption to recreational users of this area in the form of social amenity impacts of noise and vibration, air emissions, and traffic and access. These aspects have been assessed separately in Sections 6.2.5, 6.2.6 and 6.2.8, respectively.

While NPWS and Water NSW tracks will remain open, there may be interruptions arising from incr eased construction traffic. The use of the hardstand car park within Andrew Campbell Reserve as t he proposed site compound and laydown area would temporarily impact the availability of public pa rking in this area. Signage would be placed to alert pedestrians of the works. Any disruption would be minor, short term, and temporary. Temporary impacts to roadways due to full and partial road cl osure are discussed in section 6.2.8.

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

Following the completion of the works, all items associated with construction would be removed and the site would be rehabilitated to pre-existing condition or better.
Overall, potential impacts on social and visual amenity are considered minor as the works would be temporary and short-term.

During operation, the pipelines will be located belowground and will not be visible. There will be a positive social impact by ensuring a safe and reliable water supply and addressing ongoing issues (leaks) within the system.

Mitigation measures

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

Table 6-13 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.

Mitigation measures
Minimise visual impacts (e.g. retain existing vegetation where possible).
Impacts to vegetation within NPWS is not proposed. No impact to vegetation within NPWS (Prospect Nature Reserve) has been approved. Do not trim or remove vegetation within National Park land.
Direct artificial light away from sensitive receivers where possible (i.e. residents, fauna or roadways).
Maintain work areas in a clean and tidy condition.
Site restoration including roads, verges and vegetation is to be performed in consultation with private property owners and council.

6.2.10 Cumulative and future trends

Potential environmental impacts

The main potential cumulative impacts of the proposal include air quality, noise and traffic impacts during construction. These potential cumulative impacts would be localised and temporary during construction of the proposal. There is the potential for local development to be occurring in the area, and several Sydney Water projects are currently planned for the Prospect Reservoir area. However, potential cumulative impacts with such development would be minor and short term; and many planned Sydney Water projects are not proposed to start construction at the same time. The Contractor would work with Sydney Water, council and local developments to minimise cumulative impacts as required.

Future trends such as climate change were considered. Factors such as bushfires, flooding, extreme heat, and increasing frequency and intensity storm events that could impact the proposal, were considered. The proposal is unlikely to further exacerbate future trends and would increase water security for customers by improving water supply assets and addressing ongoing issues (leaks) within the system.

The proposal is unlikely to be impacted by future trends. While the proposal is in the vicinity of bushland, the assets, once operational, will be predominantly below ground. The proposal is not located in a flood prone area and is unlikely to be affected by increasing frequency and intensity storm events or extreme heat events.

Mitigation measures

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

Table 6-14 Environmental mitigation measures — cumulative and future trends

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

6.2.11 General environmental management

Table 6-15 Environmental mitigation measures — general environmental management

Mitigation measures
Sydney Water's Project Manager (after consultation with Sydney Water's environmental and community representatives and affected landowners) can approve temporary ancillary construction facilities (such as compounds and access tracks), without additional environmental assessment or approval if the facilities meet the following principles: • limit proximity to sensitive receivers • no disruption to property access • no impact to known items of non-Aboriginal and Aboriginal heritage • outside high risk areas for Aboriginal heritage • use existing cleared areas and existing access tracks • no impacts to remnant native vegetation or key habitat features • no disturbance to waterways • potential environmental impacts can be managed using the safeguards in the EIA • no disturbance of contaminated land or acid sulfate soils • will be rehabilitated at the end of construction. The Contractor must demonstrate in writing how the proposed ancillary facilities meet these principles. Any facilities that do not meet these principles will require additional environmental impact assessment. The agreed location of these facilities must be shown on the CEMP site plan and appropriate environmental controls installed.
Prepare a Construction Environmental Management Plan (CEMP) addressing the requirements of this environmental assessment. The CEMP should identify licence, approval and notification requirements. Prior to the start of work, all project staff and contractors will be inducted in the CEMP. The CEMP must be readily available on site and include a site plan which shows:

Mitigation measures

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

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

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

All site personnel must be inducted into the IMP.

Water NSW and NPWS are to be advised of any unexpected finds (e.g. heritage and contamination) within the Prosect Special Area as soon as practicable.

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

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

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

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

7 Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of T38-N01 critical water main (CWM) project. The proposal is required to ensure Sydney Water meets its obligation to provide an adequate drinking water service, while reducing our impact on National Parks and Water NSW land.

The main potential construction environmental impacts of the proposal include impacts traffic and access, heritage, temporary increase in noise and social amenity. During operation, significant impacts are not expected. Given the nature, scale and extent of impacts and implementation of the mitigation measures outlined in this REF, the proposal is unlikely to have a significant impact on the environment. Therefore, an environmental impact statement is not required under Division 5.1 of the EP&A Act.

The REF considers how the proposal aligns with the principles of ESD. The proposal will result in positive long-term environmental improvements by improving water servicing and reducing future impacts to NPWS and Water NSW. The proposal will not result in the degradation of the quality of the environment and will not pose a risk to the safety of the environment.

References

- NSW Environmental Protection Authority (EPA) 2017, NSW Noise Policy for Industry, NSW Government Sydney
- NSW Environment Protection Authority (EPA) 2020, Draft Construction Noise Guideline, NSW Government Sydney
- Aurecon Arup (2023), CWM T38-N01 Prospect Nature Reserve, Geotechnical Investigation Plan. Sydney Water.
- Aurecon Arup (2024), CWM T38-N01 Prospect Nature Reserve, Geotechnical Factual Report. Sydney Water.
- Sydney Water (2023a), Prospect T38-N01 CWM Renewal Concept Design, Preliminary Site Investigation. Sydney Water.
- Sydney Water (2023b), Renewal Project CWM T38-N01 Prospect Nature Reserve, Geotechnical Desktop Study. Sydney Water.
- Sydney Water (2024a), CWM T38-N01 Prospect Nature Reserve, Geotechnical Interpretive Report. Sydney Water.
- Sydney Water (2024b), Prospect T38-N01 CWM Concept Design, Detailed Site Investigation. Sydney Water.
- Sydney Water (2021), Prospect Reservoir, Reservoir Road WS0095 Property Environmental Management Plan. Sydney Water.
- Office of Environment and Heritage (OEH) (2012), Prospect Nature Reserve Plan of Management. OEH.
- Extent Heritage (2024a – Nov Draft 01), Prospect Reservoir Conservation Management Plan. Sydney Water.
- Extent Heritage (2024b – Nov Draft 01), Veteran Hall Archaeological Site CMP. Sydney Water.
- Aecom (2020), Aboriginal Due Diligence Assessment Prospect Reservoir, NSW. Aecom Australia.

Appendices

Appendix A – Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	There may be short-term impacts on the community during construction from minor vegetation removal, traffic management, noise impacts and dust. There will be environmental improvements by providing a reliable water servicing to the local community and addressing ongoing issues (leaks) within NPWS land.
Any transformation of a locality	The proposal will not result in the transformation of a locality.
Any environmental impact on the ecosystems of the locality	The proposal will not result in environmental impacts to ecosystems of the locality. The proposal will lead to environmental improvements by ensuring a reliable water supply, while reducing ongoing issues in NPWS land.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposal will not result in a reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality. This proposal has been designed to minimise environmental impacts to the locality, such as avoiding vegetation impacts in NPWS land, and minimising impacts to heritage items (e.g. hoop pines).
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	The proposal will have a minor impact 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. There will be minor impacts to State heritage listed items, a s.60 application has been submitted and the project will comply with its outcomes. Proposed activities will avoid potentially impacting known registered Aboriginal artefacts and PADs by implementing mitigation controls including no-go zones and stop work procedures.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposal would result in some unavoidable adverse impacts upon some elements of the environment, including removal of two exotic tree species (outside of NPWS land). These impacts are small in extent and would not impact on the habitat of any protected animals
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	The proposal will not be endangering any species of animal, plant or other form of life, whether living on land, in water or in the air. No significant impact to any threatened species is expected.
Any long-term effects on the environment	The proposal will not have any long-term impacts on the environment but will have a long-term benefit by providing a

Section 171 checklist	REF finding
	reliable and modern water servicing, including addressing ongoing issues (leaks) within NPWS land.
Any degradation of the quality of the environment	The proposal will not cause the degradation of the quality of the environment. Waterway quality is not expected to be impacted by the proposal during construction or operation. Vegetation removal has been minimised and restricted to outside of NPWS land, to help retain areas of higher quality vegetation.
Any risk to the safety of the environment	The proposal will not increase risk to the safety of the environment. It is not expected to be impacted by, or impact, future trends such as flooding and bushfire
Any reduction in the range of beneficial uses of the environment	The proposal will not have any reduction in the range of beneficial uses of the environment. The proposal is being largely installed in disturbed areas, such as cleared grassy areas and within the road corridor. Temporary lane closures during construction will partly reduce the capacity of local roadways.
Any pollution of the environment	The proposal would involve earthworks and minor vegetation impacts (outside NPWS land) which will potentially contribute to temporary impacts on local soil, water and air quality. Environmental safeguards will mitigate the potential to pollute the environment. 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. The proposal will have a positive effect, by helping to improve water supply and addressing ongoing issues (leaks) within NPWS land.
Any cumulative environmental effect with other existing or likely future activities	The proposal may have a cumulative environmental effect if construction coincides with other Sydney Water, Water NSW and NPWS works on the same site and can be adequately managed.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The proposal will not have any impact on coastal processes or hazards, and coastal processes and coastal hazards will not have any impact on the proposal.
Any applicable local strategic planning statements, regional strategic plans or district strategic plans made under the EP&A Act, Division 3.1	There are no applicable strategic planning statements or plans, as the proposal forms part of a critical water main renewal program.

Section 171 checklist	REF finding
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 – Canopy Consulting Arborist Report

Further details available upon request.

Appendix C – Non-Aboriginal heritage reports

- Aecom (2024), Prospect Water Mains Statement of Heritage Impact (SoHI). Aecom Australia.
- Aecom (2025), Prospect Rising Main, Prospect NSW: Addendum Archaeological Assessment to SoHI. Aecom Australia.
- Department of Climate Change, Energy, the Environment and Water (2025), Application (ID: 7342) under section 60 of the *Heritage Act 1977* – approval.
- Heritage NSW approved/stamped Sydney Water design plans.

Appendix D – Consideration of TISEPP consultation

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

As per Section 4.2 of this REF, the following parties were notified of the proposal:

- Consultation required under s 2.10 (1f) of the TISEPP
- Consultation with the Bradfield Development Authority (previously Western Parkland City Authority)
- Consultation with National Parks and Wildlife Services
- Consultation with Water NSW (Special Area).

Appendix E – Neutral or beneficial effect on water quality (NorBE Assessment)

NorBE assessment – is there likely to be a neutral or beneficial effect on water quality? **(assessment must consider surface and ground waters, and construction and operational stages)**	
Are there any identifiable potential impacts on water quality? What pollutants are likely? *Major potential pollutants are sediments (fine & 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?*	Section 6.2 of the REF describes the existing environment and assesses direct and indirect impacts of the proposal**.** It also identifies mitigation measures to minimise impacts. For potential impacts to water quality and associated mitigation measures refer to: • Section 6.2.1 Topography, geology, soils - Table 6-1 Mitigation measures • Section 6.2.2 Water and drainage - Table 6-2 Mitigation measures • Section 6.2.7 Waste and hazardous material - Table 6-11 Mitigation measures The potential pollutants generated by the proposal during construction are sediments, dust, and contaminants such as oil/fuel. These pollutants have the potential to impact water quality through runoff, water discharge and storage of fuels and chemicals on site.
For each pollutant list the safeguards needed to prevent or mitigate potential impacts on water quality? *These may be Water NSW endorsed current recommended practices (CRPs) and/or equally effective other practices*	The REF includes various mitigation measures to protect water quality and mitigate potential impacts. Refer to mitigation measures listed in Table 6-1, Table 6-2, and Table 6-11.
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 duration of the project. 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.

NorBE assessment – is there likely to be a neutral or beneficial effect on water quality? (assessment must consider surface and ground waters, and construction and operational stages)	
	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.
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 or equivalent, including completing an ESCP, as indicated in Table 6-1. Sediment – will be effectively contained on the site provided the required erosion and sediment controls are properly installed and maintained. Dust – offsite dust impacts would be managed though the watering and/or covering of exposed areas and conducting work in appropriate weather conditions (i.e. works would cease in windy conditions). Contaminants – would be managed through appropriate storage of contaminants, location of refueling and functional and easily accessible spill kits. Discharge – potential impacts from discharges of drinking and/or groundwater will be mitigated through the application of safeguards outlined in this REF, including dechlorinating drinking water prior to discharge, directing discharge away from the Special Area, testing for contaminants (groundwater) and appropriate disposal offsite where necessary.
Is it likely that a neutral or beneficial effect on water quality will occur? Justify	A neutral effect on water quality is likely provided the mitigation measures in this REF are properly implemented and adequately maintained.

NorBE assessment – is there likely to be a neutral or beneficial effect on water quality? (assessment must consider surface and ground waters, and construction and operational stages)	
	When the proposal has been completed, the level of pollutants will be the same as they were before the proposal commenced (i.e. neutral effect).

Appendix F – Aboriginal heritage due diligence (AHDD)

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

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

Appendix G – Conservation management plans (drafts)

Further details available upon request.

- Extent Heritage (2024a – Nov Draft 01), Prospect Reservoir Conservation Management Plan. Sydney Water.
- Extent Heritage (2024b – Nov Draft 01), Veteran Hall Archaeological Site CMP. Sydney Water.

Appendix H – Noise mitigation measures – definition of recommendations

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

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

Abbreviation	Mitigation measure and description
DR	Duration respite: Respite offers and respite periods 1 and 2 may be counterproductive in reducing the impact on the community for longer duration projects. In this instance and where it can be strongly justified it may be beneficial to increase the work duration, number of evenings or nights worked through Duration Respite so that the project can be completed more quickly. RDC staff should engage with the community where noise levels are expected to exceed the NML to demonstrate support for Duration Respite.
AA	Alternative accommodation: Alternative accommodation options may be offered (as a last resort) to residents living in close proximity to construction works (within the distance nominated by the noise estimator) that are likely to experience highly intrusive noise levels.