Review of Environmental Factors

WP0123 Allawah HV Upgrade (June, 2025)

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Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of WP0123 Allawah HV Upgrade. 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.

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 and endorsed by:	Endorsed by:
[redacted]		
Jennifer Shaw Sydney Water Date: 05/06/2025	Jude Gregory Environment Representative Sydney Water Date: 05/06/2025	Ananta Mukherjee Senior Project Manager Sydney Water Date: 05/06/2025

Decision Statement

The main potential construction environmental impacts are associated with noise, traffic, ecology and visual amenity. During operation, the main potential impacts are associated with visual amenity. 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.

Determined by:		
	Murray Johnson, Senior Manager, Environment & Heritage Services, Sydney Water	Date: 17/06/2025
	[redacted]	

1 Proposal description

Table 1 Description of proposal

Aspect	Detailed description
Proposal need and objectives	Allawah Water Pumping Station WP0123 (the pumping station) was commissioned in 1966, and the high voltage (HV) (11 kilovolt (kV)) equipment has passed its design and useful life. Due to the age of this asset, there is high likelihood of major failure. Further, the existing infrastructure does not provide arc fault containment and operator safety concerns have been identified. The proposal is to upgrade existing electrical assets at the end of their useful life, to ensure the ongoing safe and reliable energy supply for Sydney Water operations.
Consideration of alternatives/options	In May 2015, Sydney Water began a review for the renewal of the HV assets within the pumping station. In July 2016, it was identified that these assets and additional HV assets outside of the pumping station required upgrades to meet current standards. High level options were explored, such as overhead cabling and installing electrical conduits within the council footpath on the western side of Forest Road, adjacent to the pumping station site. However, these options were disregarded as the overhead cabling would have a visual impact on the heritage value of the Allawah Reservoir, and the electrical conduits could impact the heritage listed watermain on the western side of Forest Road. In addition, the 'do nothing' option would place the pumping station and operators at risk. Through multiple design reviews and options workshops, the current design was chosen as the preferred option.
Proposal description and methodology	The proposal is for a new HV switchroom and transformer yard, and includes: • establishing site • removing vegetation including 18 trees in the pumping station site and up to 12 trees along Kenwyn Street • excavating up to 1 m deep for new HV switchroom and transformer yard foundations and footings, including a new driveway and 4 car parks • trenching pits and conduits for HV and low voltage (LV) cabling • constructing a new masonry HV switchroom about 23 m x 10 m x 4.5 m (high), with 2 new 11/3.3 kV transformer kiosks on a concrete slab • installing new underground 3.3 kV cables from the transformers, to supply power to the existing 3.3 kV switchboard

	• installing external lighting and ventilation to the new HV switchroom • installing 2 new Ausgrid Rising Main Units (switchgear units) near the main pumping station site entrance on Kenwyn Street • relocating some existing services • laying new HV cable including connections in Kenwyn Street and Forest Road via open trenching (about 1 to 2 m deep and about 0.5 m wide) • potentially removing and disposing of existing transformers • restoring site and demobilising.
Location and land ownership	The proposal is on Sydney Water owned property at 2 Forest Road (Lot 1/ DP73077 and Lot B DP 303573) and along sections of Forest Road and Kenwyn Street in Hurstville (the proposal area) (Figure 1). The proposal area is in the Georges River Council and Bayside Council Local Government Areas (LGAs).
Site establishment and access tracks	Access to the pumping station site would be via the existing access on Kenwyn Street.
Ancillary facilities (compounds)	A construction compound in the Sydney Water property would be used for plant, equipment and materials laydown and stockpiling. An indicative location for the construction compound is shown on Figure 1.
Work hours	Work and deliveries will be scheduled during standard construction hours: • 7 am to 6 pm, Monday to Friday • 8 am to 1 pm, Saturdays. Most of the proposal is expected to occur during standard construction hours. However, to minimise disruption to traffic and potential safety risks to construction personnel and road users, the new HV cabling works on Kenwyn Street and Forest Road would be completed out of hours (evening and night). Out of hours work (OOHW) are defined as: • Out of hours day: Saturday 7am to 8am and 1pm to 6pm, Sunday and public holidays 8am to 6pm • Out of hours evening: daily 6pm to 10pm • Out of hours night: all other times. OOHW shifts would be completed by 6 am in accordance with the Road Occupancy Licence (ROL). It is anticipated that about 7 months of OOHW is required.

Proposal timing	Construction is expected to start early 2026 and take about 1.5 years to complete.
Operational requirements	Near completion of the proposal, during cutover to the new switchroom, the pumping station may be offline for up to 4 weeks and 10 days of commissioning works. The cutover would be done in stages. Network Operations have advised that there is a contingency downstream/upstream in the network to supply water during each stage. Disruptions to water supply during cutover are not anticipated.

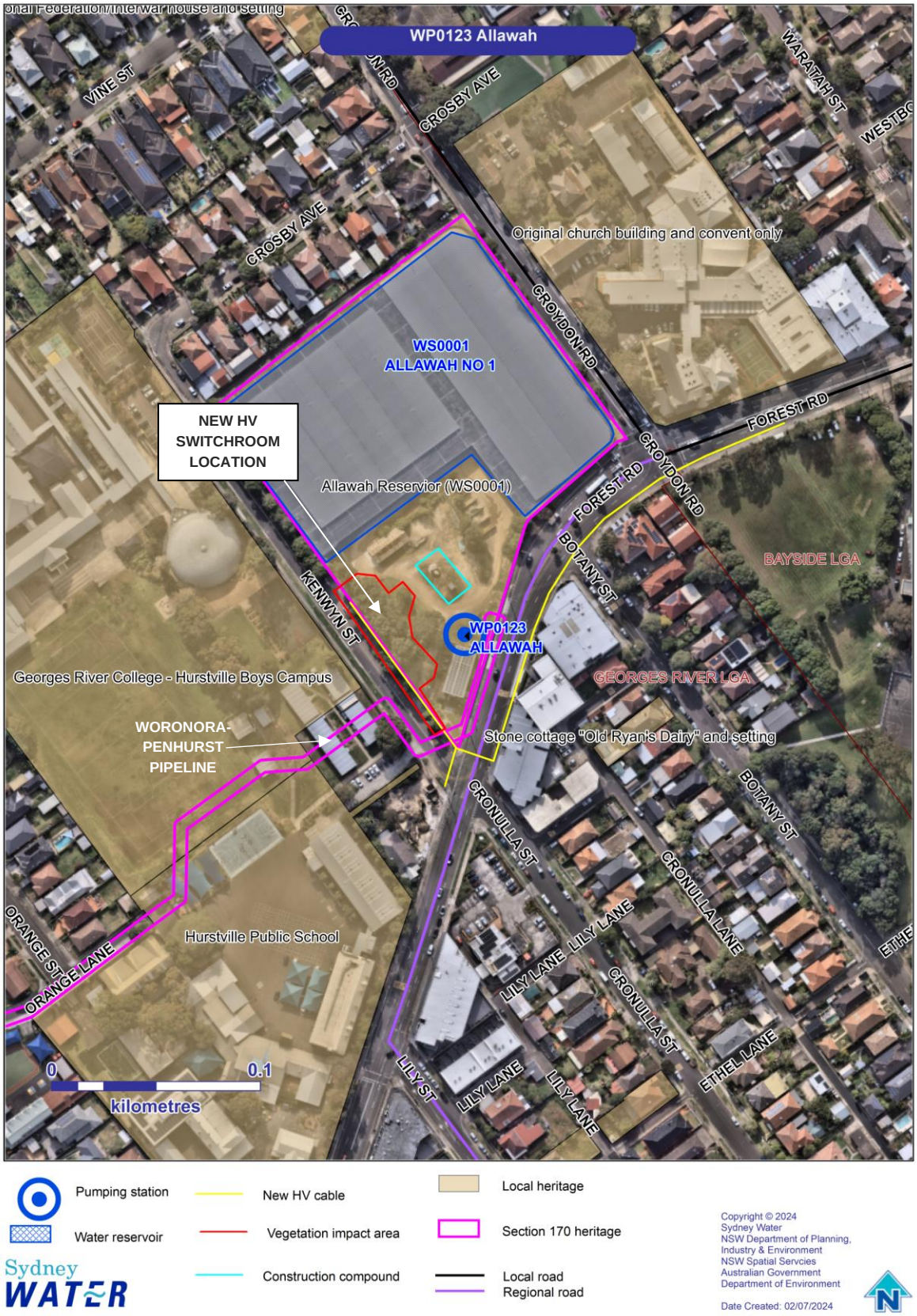

Figure 1 Location of proposal and environmental constraints

2 Consultation

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.

Consultation required under State Environmental Planning Policies and other legislation

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

Consultation was required under section 2.10 as the proposal involves excavation of road or a footpath adjacent to a road for which the council is the roads authority, that is not minor or inconsequential. Georges River Council was consulted on 27 June 2024. Feedback was received on 3 July 2024, consisting of conditions for council road openings. A summary of feedback from this letter is provided below:

- A Land Access notice must be submitted to Council prior to the commencement of works. The Delivery Contractor must provide Council a Restoration Order with details of the openings that are to be restored. Final restorations of all disturbed Council assets are to be completed by Council.
- The Delivery Contractor must be covered by public liability insurance to cover potential damage to underground services.
- The site must be barricaded and safe paths for pedestrians maintained until final restoration.
- Excavation is to be through neat saw cut openings.
- Ensure appropriate management of soil.
- No pollution of Council's drainage system by excavated or fill materials during construction.
- Road, paved footpath and concrete vehicular crossing trenches must be backfilled with clean fill sand and compacted with fine crushed rock.

- Whole of slab replacement required for footpaths and driveways to the nearest expansion or control joint.
- Notification to adjacent residents and businesses prior to works commencing.

The Georges River Council response has been considered in Section 4 and 5 of this REF. Georges River Council will be consulted again closer to construction.

Prior to construction, the Delivery Contractor must also obtain a ROL for the proposal. Consultation with Transport for NSW (TfNSW) would occur as part of this process.

3 Legislative requirements

Table 2 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Georges River Local Environmental Plan 2021 (LEP)	The proposal is on land zoned SP2 (Infrastructure - Water Supply System), R2 (Low Density Residential) and E1 (Local Centre).
Bayside LEP 2021	The proposal is on land zoned SP2 (Infrastructure – Classified Road).
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Section 2.159(1) of the TISEPP permits development by or on behalf of a public authority for water reticulation systems without consent on any land. The proposal involves upgrading the power supply to the pump station, which is part of the water reticulation system. As Sydney Water is a public authority, the proposal is permissible without consent.
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.

Table 3 Consideration of key environmental legislation

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas and	REF	Pre-construction, Sydney Water

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	species, populations and communities and heritage items. There is potential for EPBC Act listed threatened species to occur in the proposal area. However, the proposal is unlikely to have a significant impact on these species as discussed in Section 4.		
Biodiversity Conservation Act 2016 (BC Act)	The BC Act lists species and ecological communities which are protected in NSW. There is potential for BC Act listed threatened species to occur in the proposal area. However, the proposal is unlikely to have a significant impact on these species as discussed in Section 4.	REF	Pre-construction, Sydney Water
National Parks and Wildlife Act 1974 (NPW Act)	The proposal is not within or adjacent to any national park. There are no registered AHIMS sites that are within 200 m of the proposal. As such no AHIP is required.	N/A	N/A
Heritage Act 1977	The proposal is within the Allawah Reservoir and Woronora-Penhurst Pipeline site boundary. Allawah Reservoir (WS0001) is listed on the *Sydney Water s.170 Heritage Register,* and Georges River Council LEP (Item I71). The Woronora-Penhurst Pipeline is also listed on the *Sydney Water s.170 Heritage Register.* The proposal is not expected to impact the heritage values of any items listed on any heritage register, or any items classified as 'relics' under the Heritage Act.	Sydney Water Local Heritage Item Impact Approval	Pre-construction, Sydney Water
Water Act 1912/ Water Management Act 2000 (WM Act)	Under section 91B of the WM Act Sydney Water are required to obtain a Water Supply Work Approval (WSWA) for the temporary dewatering of groundwater. Large amounts of groundwater are unlikely to be encountered during construction due to the shallow depth of excavations. However, if required, a WSWA must be obtained before any groundwater is dewatered for the works.	WSWA	Pre-construction, Delivery Contractor

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Roads Act 1993 (Roads Act)	The Roads Act classifies roads, regulates the uses and access of public and private roads and establishes procedures for road occupancy. Work is required within Forest Road (State and regional road). This includes work within 100 m of a traffic signal. As such, a ROL will be required.	Road Occupancy Licence	Pre-construction, Delivery Contractor

4 Environmental assessment

Existing environment

The proposal is at Allawah Reservoir (WS0001) and Allawah Water Pumping Station (WP0123). The proposal area comprises the reservoir in the north, and pumping station infrastructure, including an existing switchroom and transformer yard in the south. The proposal area also includes sections of Kenwyn Street and Forest Road for the new HV cable alignment. See Figure 1.

Generally, the Sydney Water site is flat with mature planted trees on the western boundary and a loop access road from Kenwyn Street through the center of the property. The site is currently used as a depot by Sydney Water, with several material storage bays within the site.

The environmental impacts checklist (SWEMS0019.01) was completed for the works which considers all environmental aspects. Table 4 includes only the potentially impacted aspects.

Table 4 Key environmental aspects and potential impacts of construction and operation

Aspect	Potential impacts
Topography, geology and soils	The geology of the proposal area predominantly comprises shale and laminate (D4C 2022a). The proposal has the potential to impact topography, geology and soils through: • soil erosion and generation of sediment laden run-off from excavations and material stockpiles • inadvertent transfer of soil off-site by work vehicles • mismanagement of contaminated soil during excavation that could contribute to the spread of contaminated material • landscaping and other topography changes. Excavation is required for the new HV switchroom and transformer foundations, for pits and HV and LV cabling conduits, and for the new HV cable along Kenwyn Street and Forest Road. This would require the temporary stockpiling of excavated materials. Additionally, the movement of vehicles and staff has the potential to cause minor ground disturbance.

	An interpretive contamination report for the works within the Sydney Water site (D4C, 2022b), identified fill material and potential contamination including: • heavy metals • total recoverable hydrocarbons • polycyclic aromatic hydrocarbons • organochlorine pesticides. Contaminants were detected in samples from the surface up to 1 m below ground level (BGL). The contamination report identifies that the site has an extremely low probability of acid sulfate soil (ASS) occurrence. No analysis of ASS potential was undertaken, however pH results for selected samples indicated the ASS potential. At the time of writing this REF, soil sampling and waste classification have not been carried out for the works along Kenwyn Street and Forest Road. However, these works are not in an area mapped as having the potential to encounter ASS or any contaminated sites notified to the NSW EPA. No changes to topography are required for the proposal. Considering the nature and scale of the works, construction impacts to topography, geology and soil are considered minor and can be adequately managed by applying the mitigation measures. No impacts are anticipated during operation.
Water and drainage	The proposal has the potential to impact water and drainage through offsite sedimentation, accidental spills, groundwater dewatering or changing drainage patterns. There are no waterways close to the proposal. However, there is the potential for indirect impacts from sedimentation to the stormwater system if open excavations and spoil is poorly managed. Similarly, fuel and chemicals could impact surface and groundwater through accidental spills and mismanagement. No topographical changes are proposed. Groundwater seepage was not encountered in any of the geotechnical investigation boreholes in the Sydney Water site. However, a Geotechnical Interpretive Report (D4C, 2022a) noted that groundwater inflow could occur, and would be influenced by seasonal fluctuations and any prolonged and intense rainfall periods. Based on the results of the geotechnical investigations within the pumping station site and the shallow depth of excavations, the proposal is unlikely to encounter groundwater along Kenwyn Street and Forest Road. Further geotechnical investigations will be carried out prior to construction of the new HV cabling. If groundwater is encountered, a WSWA is required before any excavation dewatering occurs (refer to Section 3 of this REF). Potential impacts to water and drainage during construction would be minimal and can be adequately managed by implementing the mitigation measures. No impacts are anticipated during operation.
Flora and fauna	The proposal has the potential for direct impacts flora and fauna through vegetation removal, and indirect impacts to fauna from noise, lighting and spreading of weeds.

Eighteen trees would be cleared on the pumping station site and up to 12 trees along Kenwyn Street.

An ecological assessment was prepared for the proposal (Appendix D), including database searches and field investigation. The study area for this assessment included the pumping station site and adjacent street trees on Kenwyn Street (Figure 2). The vegetation impact area is within the study area and shown on Figure 1.

No known plant community types (PCTs) were recorded in the study area. The survey also confirmed no BC or EPBC Act threatened ecological communities (TECs) within the study area.

There were 12 threatened flora and 57 threatened fauna desktop records within a 10 kilometre radius of the study area. Of these, the following were considered likely to occur on the pumping station site based on number and proximity of species sighting records:

- Grey-headed Flying-Fox *Pteropus poliocephalus* (Vulnerable, BC and EPBC Act)
- Little Bent-winged Bat *Minioperus australis* (Vulnerable, BC Act)
- Large Bend-winged Bat *Miniopterus orianae oceanensis* (Vulnerable, BC Act)
- Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris* (Vulnerable, BC Act)
- Greater Broad-nosed Bat *Scoteanax rueppellii* (Vulnerable, BC Act), and
- Southern Myotis *Myotis macropus* (Vulnerable, BC Act).

No threatened flora or fauna were identified during the survey.

The field investigation noted the vegetation in the study area comprised urban / exotic and planted native vegetation. The vegetation within the vegetation impact area included:

- fifteen locally native Swamp Oak *Casuarina glauca*
- two non-locally native planted Kurrajong *Brachychiton populneus* trees
- one non-locally native planted *Eucalyptus* sp.
- no mid-storey, with ground cover consisting of maintained exotic lawns
- twelve non-locally native planted Brush Box (*Lophostemon confertus*) along Kenwyn Street, with no mid-storey or under-storey.

Outside of the vegetation impact area, within the north and north-western sections of the study area, vegetation comprised:

- several weed species including Firespike (*Odontonema* sp.), Fishbone Fern (*Nephrolepis exaltata*)
  Cotoneaster (*Cotoneaster glaucophyllus*) and Olive Trees (*Olea europea*).
- one priority weed - Broad-leaf privet (*Ligustrum lucidium*).

Of the 30 trees within the vegetation impact area, 3 Swamp Oak trees had 4 potential small hollows in trunks and limbs that may be used for roosting and/or

	breeding by threatened microbat species (refer to Figure 2). Removing the 3 hollow-bearing trees (HBTs) would be avoided if possible during construction, however a Test of Significance (ToS) was completed for threatened hollow-dependent microbats if HBT removal cannot be avoided. The ToS found that potential removal of 3 HBTs is unlikely to result in significant impact to threatened hollow-dependent microbats. The remainder of the vegetation impact area provides minimal foraging resources for threatened fauna. Whilst threatened fauna may use the site on rare occasion as a foraging or temporary roosting resource in transit, they are unlikely to rely on the site as part of their lifecycle. Remaining threatened fauna were deemed unlikely to occur on site and no additional assessment would be required. No statutory offsetting applies to the proposal however, Sydney Water provides non-statutory offsets for impacts to biodiversity in accordance with the *Biodiversity Offset Guide*. Offsetting requirements based on the vegetation impact area are detailed in Appendix D. A potential on-site offsetting location was identified during the survey and is shown in Figure 2. Areas north of this potential offsetting location within the pumping station site could also be used for additional offsetting, but would first require appropriate biosecurity management to address the extensive weed incursion (Figure 2). Potential impacts to flora and fauna during construction can be adequately managed by implementing the mitigation measures, including vegetation offsetting. No impacts are anticipated during operation.
Heritage	The proposal has the potential to impact heritage items through ground disturbance or indirectly through vibration (refer to the noise and vibration section below). **Aboriginal Heritage** A basic search of the Office of Environment and Heritage's Aboriginal Heritage Information Management System (AHIMS) was undertaken on 6 May 2025. No registered Aboriginal heritage sites or objects were identified within 200 m of the proposal. The proposal is not located in a high-risk landscape and has been previously disturbed due to the construction and operation of the reservoir and pumping station. The risk of potential Aboriginal objects or archaeological objects existing in the proposal area is low. **Non-Aboriginal Heritage** The proposal is in Allawah Reservoir (WS0001), listed on the *Sydney Water s.170 Heritage Register* (s.170 register – listing 4575742), and Georges River Council LEP (Item I71). Allawah Reservoir (WS0001) is a relatively late example of a rectangular or irregular shaped concrete reservoir with walls supported by slender concrete triangular buttresses. The Reservoir and associated pumping station (WP0123) are important for the role they have played in extending the supply of Warragamba water into the Woronora System. A Sydney Water Local Heritage Item Impact Approval (Non-Aboriginal) for items of local heritage significance was prepared for the works and approved by Sydney

Water's Heritage Advisor on 4 June 2025. The approval notes that the proposal will have a minor visual impact on the greater Allawah Reservoir site but no adverse heritage impact on the fabric, function or significance of the reservoir.

The works allow the pumping station and the reservoir to continue to function reliability and effectively into the future. This allows the Allawah Reservoir to continue to function for the purpose it was built. This conserves the primary heritage value of the reservoir and its important role in providing water to residents of Sydney linked to the Woronora water supply scheme.

Outside of the pumping station site, the HV cable laying works cross the s.170 register Woronora Penshurst Pipeline local heritage curtilage (listing 4570509) on Kenwyn Street. This structure is potentially subject to high pressure and as such, a non-destructive digging method of excavation would be used above the Woronora-Penshurst Pipeline to avoid impacts. A Sydney Water Local Heritage Item Impact Approval was also prepared for the Woronora Penshurst Pipeline and approved by Sydney Water's Lead Heritage Advisor on 29 November 2024.

The following local heritage listings are within 100 m of the proposal:

- Georges River LEP: Georges River College – Hurstville Boys Campus (listing I108) 20 m west of Allawah Reservoir site
- Georges River LEP: Hurstville Public School (listing I72) 30 m west of Allawah Reservoir site
- Bayside LEP: Original church building and convent (listing I133) 15 m north-east of Allawah Reservoir site
- Georges River LEP: Stone cottage 'Old Ryan's Dairy' and setting (listing I23) 43 m east of Allawah Reservoir site.

The proposal will not involve activities within the curtilage of any of the above locally listed heritage items and no indirect impacts are expected.

Potential impacts to Aboriginal and non-Aboriginal heritage items during construction are unlikely provided the mitigation measures are implemented. No impacts are anticipated during operation.

Noise and vibration

The likelihood of noise impact from the proposal was reviewed against risk factors (based on Table 2 of the EPA's 2020 *Draft Construction Noise Guideline*). The review indicated that the construction noise impact is a medium-high risk and therefore a quantitative noise impact assessment was undertaken (Appendix E). The TfNSW Construction and Maintenance noise estimator tool (TfNSW, 2022) was used for the assessment.

The purpose of the noise assessment is to assess the predicted worst-case noise impacts to surrounding receivers. Quantifying these impacts will assist in identifying how many receivers may be impacted at different times and during different activities. Where receivers are predicted to experience noise impacts, recommended mitigation measures at different noise impact levels have been identified. This will guide the community engagement for the sites and further mitigation measures where appropriate.

Existing environment

The proposal is predominantly in areas zoned for infrastructure and local centres (commercial). The proposal area also includes some areas zoned as low density residential. The closest receivers adjacent to the proposal include non-residential receivers such as schools and commercial businesses, as well as some residential receivers (Figure 3).

Construction noise impacts

Potential construction noise impacts from the proposal are summarised below:

- Overall construction duration would be about 17 months. Works in the Sydney Water property at the the pumping station are likely to be for the full 17 months during standard construction hours.
- About 7 months of OOHW (evening and night) will be required for HV cable laying and connection works along Kenwyn Street and Forest Road. This would be in addition to works during standard construction hours within Sydney Water property (i.e. consecutive day and night shifts).
- The proposal requires the intermittent use of large/noisy equipment such as a 130 T crane, an excavator with hammer, concrete saw, chainsaw, stump grinder etc.
- Large equipment movements including mobilising and demobilising a 130 T crane to the pumping station site.

The proposal requires up to 5 OOHW shifts a week for the HV cable laying and connection works along Kenwyn Street and Forest Road. This is pending weather, ROLs, community engagement outcomes and any other unforeseen events.

The assessment was performed based on the following inputs:

- Background noise levels of 50 dB(A) during standard construction hours and 40 dB(A) for OOHW.
- Noisiest plant chosen during standard construction hours was a chainsaw for tree removal (Activity 1). This activity would only take about 2 days.
- Noisiest plant chosen during OOHW (night) was a 13.5 T excavator with hammer to excavate the road and lay new HV cable along Kenwyn Street and Forest Road (Activity 2). The excavator with hammer would be required for about 4-5 hours per shift, for 3 months. The excavator with hammer would be used prior to midnight for most shifts. These works would advance along the alignment at an average rate of 5 to 8 m per shift. Noise levels will increase as the work approaches a receiver and then decrease as they move past. Typically, equipment would not be in front of any one property or receiver for more than 2 shifts.
- The nearest line of sight receivers are predominantly schools and commercial businesses adjacent to or across the road from the proposal. There are also some mixed commercial and residential properties on Forest Road adjacent to the proposal.

- The nearest receivers with no line of sight are residential properties behind the nearest line of sight receivers on Forest Road, about 40 m from the proposal.

Results from the assessment are summarised below:

- Receivers (residential and non-residential) within 30 m are predicted to experience noise levels of 75dB(A) or greater (highly affected) during Activity 1 (Figure 4 and Figure 5).
- Residents within 70 m with line of sight are predicted to experience noise levels of 75dB(A) or greater during Activity 2 (highly affected) (Figure 6).
- Residents within 70 m with no line of sight are predicted to experience noise levels of greater than 30dB(A) above background during Activity 2 (highly intrusive) (Figure 6).

These predicted noise impacts represent a conservative approach, as they assume use of a chainsaw and 13.5T excavator with hammer every shift for the duration of the construction program. The noisiest work largely be completed within about 8-9 months out of the 17 month construction program. In addition, the HV cabling works will move progressively along the alignment. Further, many of the receivers surrounding the proposal are non-residential and would not experience noise impacts outside of standard construction hours.

Community consultation will be performed prior to construction to inform the mitigation measures.

Mitigation measures have been identified to reduce the risk of construction noise impacts. This includes community engagement, noise barriers, staff awareness and training. Community consultation may also inform appropriate respite periods and further mitigation measures to be adopted.

Operational noise impacts

Operational noise impacts from the proposal are not anticipated.

Construction vibration impacts

The noise estimator includes some indicative minimum working distances for different vibratory plant and equipment. An excavator with hammer (medium hydraulic hammer) has a 7 m safe working distance for light framed structures (BS 7385) and 19 m for heritage and other sensitive structures (DIN 4150) to avoid cosmetic damage. A minimum working distance of 23 m is also recommended for human comfort.

The excavator with hammer would be required for the proposed HV cable laying works on Kenwyn Street and Forest Road. There are structures and residential receivers along Forest Road within 7 m of the proposed works (Figure 3).

Like construction noise impacts, residential receivers would experience increased vibration impacts as the work approaches a receiver and then decrease as they move past. Typically, equipment would not be in front of any one property or receiver for more than 2 shifts.

The proposed HV cable laying works would also be within 19 m of the following

	local heritage curtilages, listed on the Bayside LEP, Georges River LEP and the s.170 register (Figure 1): • Allawah Reservoir (WS0001) • Woronora Penshurst Pipeline • Georges River College – Hurstville Boys Campus • Hurstville Public School • Original church building and convent only. While the works would be within 19 m of the heritage curtilages, the heritage structures for all sites except the Allawah Reservoir and the Woronora Penshurst Pipeline would be outside of the 19 m. The Allawah Reservoir listing includes the existing pumping station, which would be about 10 m from the proposed HV cable laying works. Potential impacts can be managed through the mitigation measures. The Woronora Penshurst Pipeline is anticipated to be more than 1.5 m deep at the location of the proposed HV cable laying works. In addition, a non-destructive digging excavation methodology is proposed, to minimise potential vibration impacts. Operational vibration impacts from the proposal are not anticipated. Potential impacts from noise and vibration during construction can be managed by the mitigation measures.
Air and energy	During the works, there is potential to impact air quality by generating: • dust during excavation and movement over disturbed ground • emissions from machinery, equipment and vehicles used during construction. Due to the small scale and temporary nature of the works, large quantities of dust and vehicle emissions are not expected. Any minor impacts on air quality from the proposal will be localised and short-term. Air and energy impacts are not expected during operation.
Waste and hazardous materials	A Hazardous Building Material (HBM) report for the pumping station identified the presence of lead paint/dust, asbestos containing material, and polychlorinated biphenyls (PCBs) on internal and external features of the facility. There is potential for these materials to be encountered when connecting new cables to the existing switchroom. The interpretive contamination report included soil sampling and testing for waste classification purposes, noting the following within the Sydney Water site: • Natural material up to 0.5 m BGL should be classified as general solid waste, and deeper natural material further assessed to determine if ASS are present. If not ASS, then the deeper natural material can be classified as Virgin Excavated Natural Materials. If ASS is present, the material should be treated and disposed of as general solid waste. • While contaminants were detected in samples of fill material, the results were below the thresholds for total concentrations of compounds in soil and specific contaminant concentrations for leachability testing. As such, it can

	be classified as general solid waste according to the Waste Classifications Guidelines (NSW, EPA, 2014). General construction waste is expected. Soil and waste that cannot be re-used (e.g. Council road and footpath excavated fill), would be classified according to the Waste Classifications Guidelines and be disposed of at an appropriately licenced facility. Except for the potential need to manage and/or dispose of HBM in the existing switchroom, it is not expected that hazardous waste will be generated by the proposal. With the implementation of the mitigation measures, impacts to waste and hazardous materials can be adequately managed, and residual impacts are expected to be low. No impacts are anticipated during operation.
Traffic and access	Access to the pumping station site is via Kenywn Street. Kenywn Street is a cul-de-sac with street parking on the north-eastern side of the road only. It provides access to Allawah Reservoir, and small carparks for Hurstville Public School and Georges River College. Trench work within the roadway / verge in Kenwyn Street and Forest Road for the HV cable laying will likely require the closure of one lane and the footpath. Whilst there is limited through traffic within Kenwyn Street, this work would be carried out outside of standard hours, with impacts managed under ROL conditions. Where possible, all vehicles and equipment associated with the proposal will be accommodated onsite. Workers may need to use some on street parking, and truck movements are anticipated, including material and equipment deliveries and waste removal. Trucks currently enter the site during normal operations, and some Sydney Water trucks are parked at this site at night. Access to Allawah Reservoir may be limited during construction works and the number of trucks that can park in the depot at night may be affected. This will be discussed with Sydney Waters operations team prior to the commencement of work. Potential impacts to traffic and access during construction can be adequately managed by implementing the mitigation measures. No impacts are anticipated during operation.
Social and visual	Social impacts relating to noise, vibration, traffic and parking are assessed above. The existing pumping station building can be partially viewed from Forest Road, but is largely blocked by fencing along the property boundary. Views of the pumping station site from Kenwyn Street are partially shielded by vegetation at the south western edge of the site and street tree planting. During construction, there would be temporary visual impacts due to additional vehicles, plant and equipment on site. This includes a large crane which may be visible from further away but would not be required for the entire construction duration. In addition, the Sydney Water site is currently used as a depot and additional plant and equipment on site would result in a minor incremental visual impact. Residential receivers along Forest Road may be impacted by lighting towers used during OOHW. However, the HV cable laying works would progress

	about 5 to 8 m per shift, so the same receivers would not be impacted for the entire duration of the HV cable laying works. During operation, there would be a change to visual amenity through the removal of vegetation within the pumping station site and replacement with a masonry building (i.e. the new HV switchroom), and removal of vegetation along Kenwyn Street. These changes will be most noticeable from the adjacent schools, but largely obstructed from other viewpoints due to existing infrastructure. The new switchroom will be consistent with the built form of the pump station and existing switchroom buildings at the site. Street tree planting along Kenwyn Street may also be removed, resulting in a negative visual impact to the users of Kenwyn Street and adjacent schools. Opportunities to re-plant street trees along Kenwyn Street were explored however, this was not recommended due to the shallow depth of the new HV cables. The council will be engaged prior to construction to discuss potential offset replanting options. Potential social and visual impacts during construction can be adequately managed by implementing the mitigation measures.
Cumulative and future trends	The proposal is unlikely to further exacerbate future trends such as those related to climate change, due to the limited scope of works. As the proposal involves work on existing assets, there is no change to the likelihood of the works being impacted by future trends such as flooding. Stormwater and drainage designs for the proposal have considered changes to impermeable areas and flooding risk. There are no current relevant development applications or major projects that could lead to cumulative impacts and no impacts are anticipated during operation.

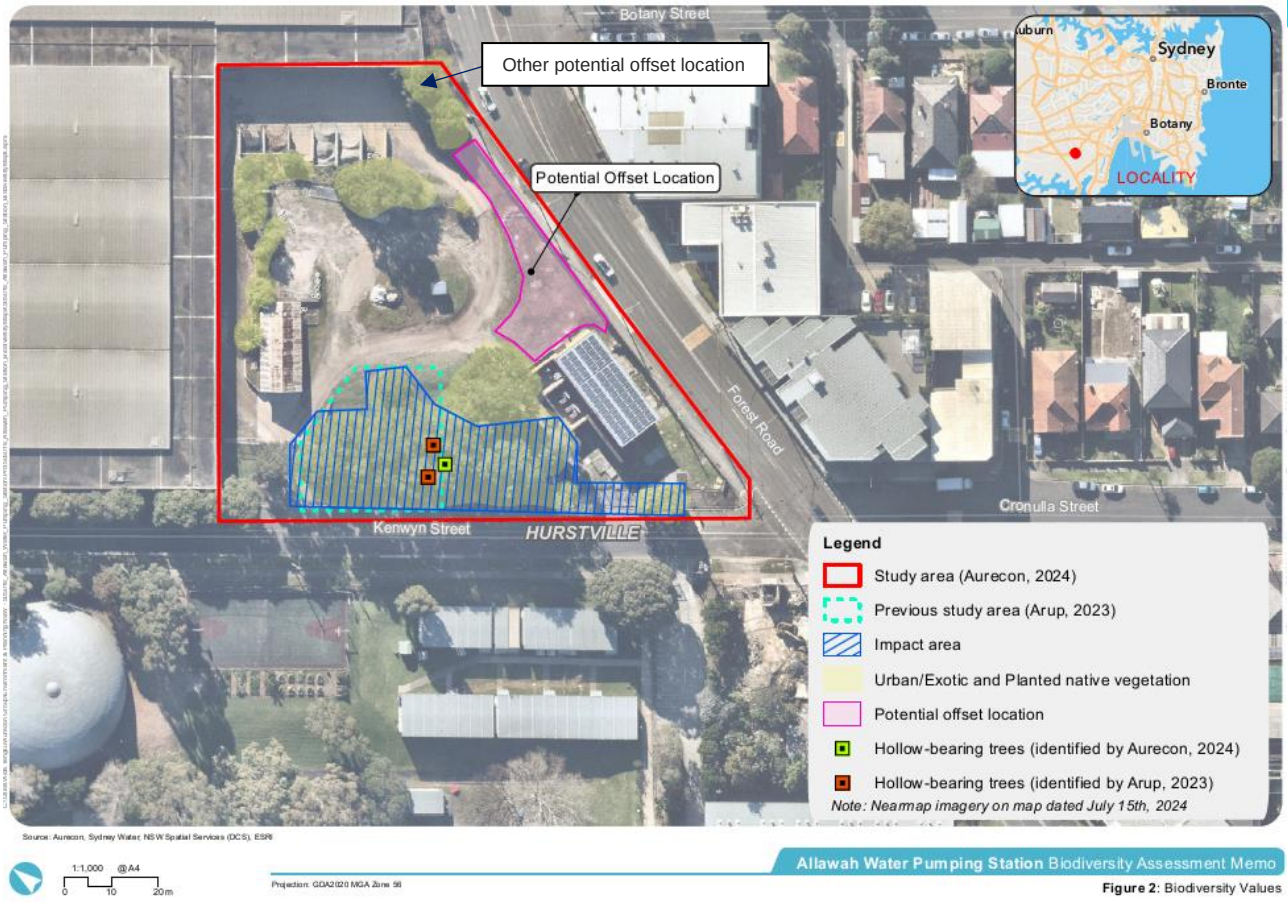

Figure 2 Biodiversity values

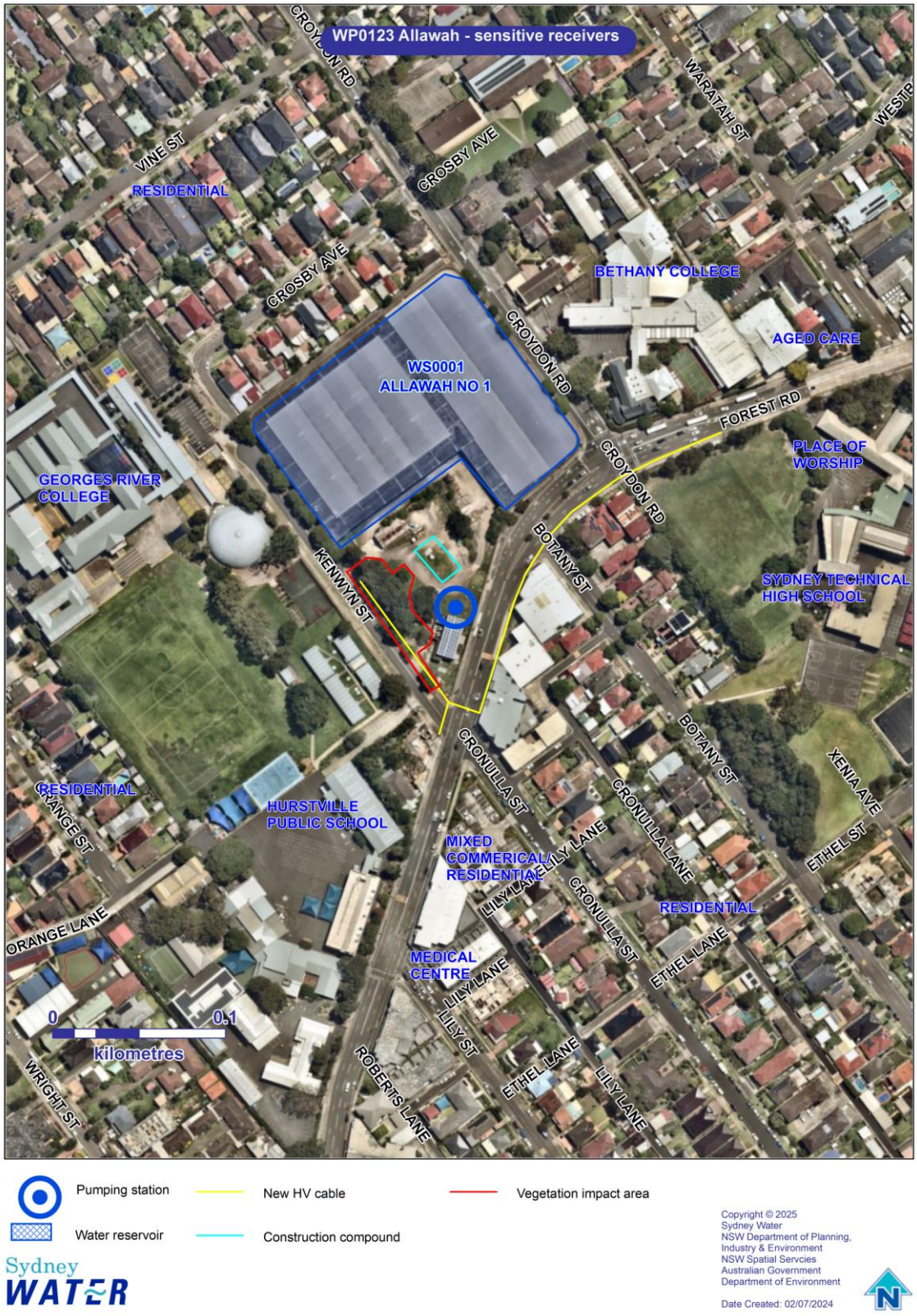

Figure 3 Noise sensitive receivers

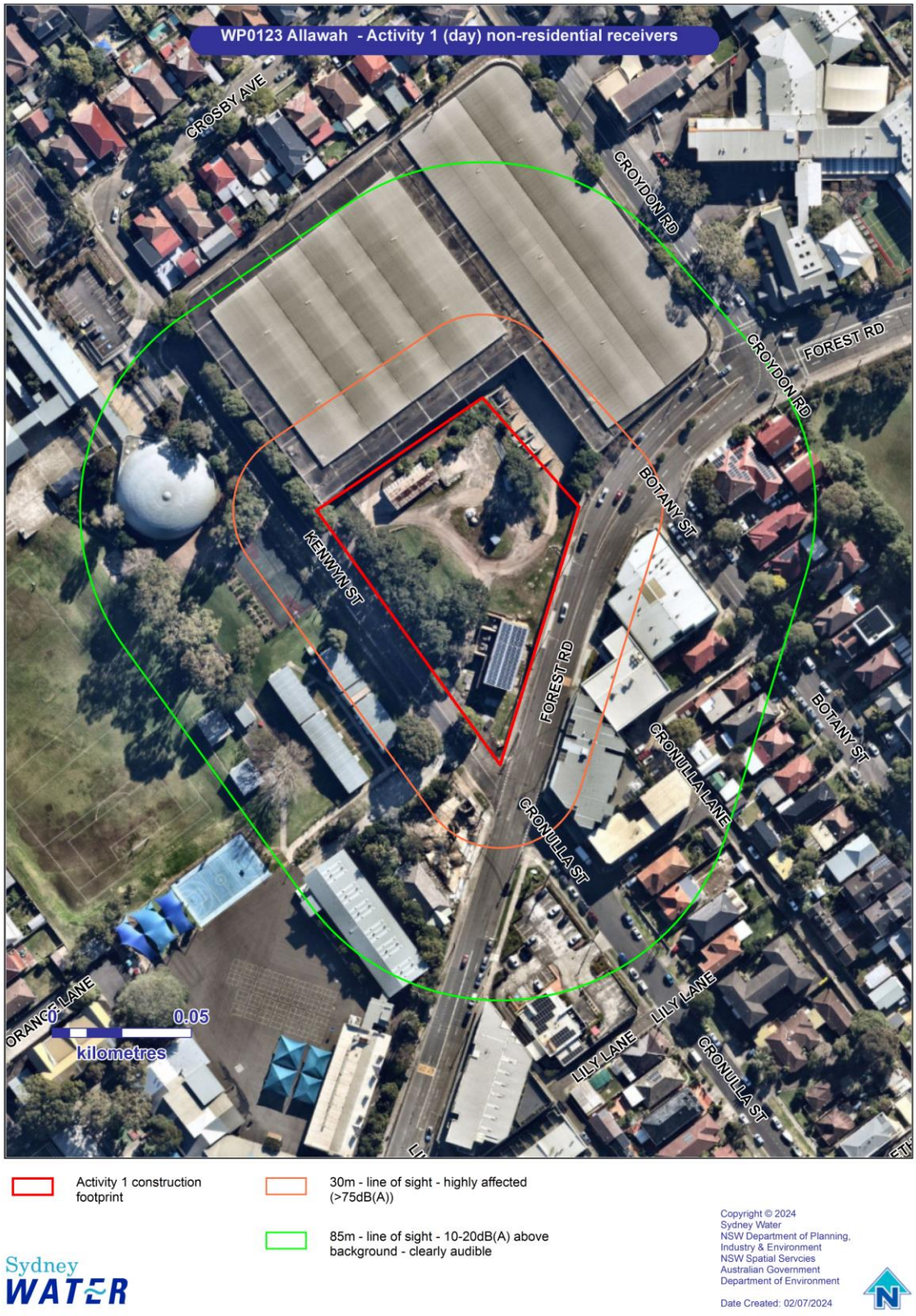

Figure 4 Non-residential receivers within affected distances during Standard Construction Hours (day)

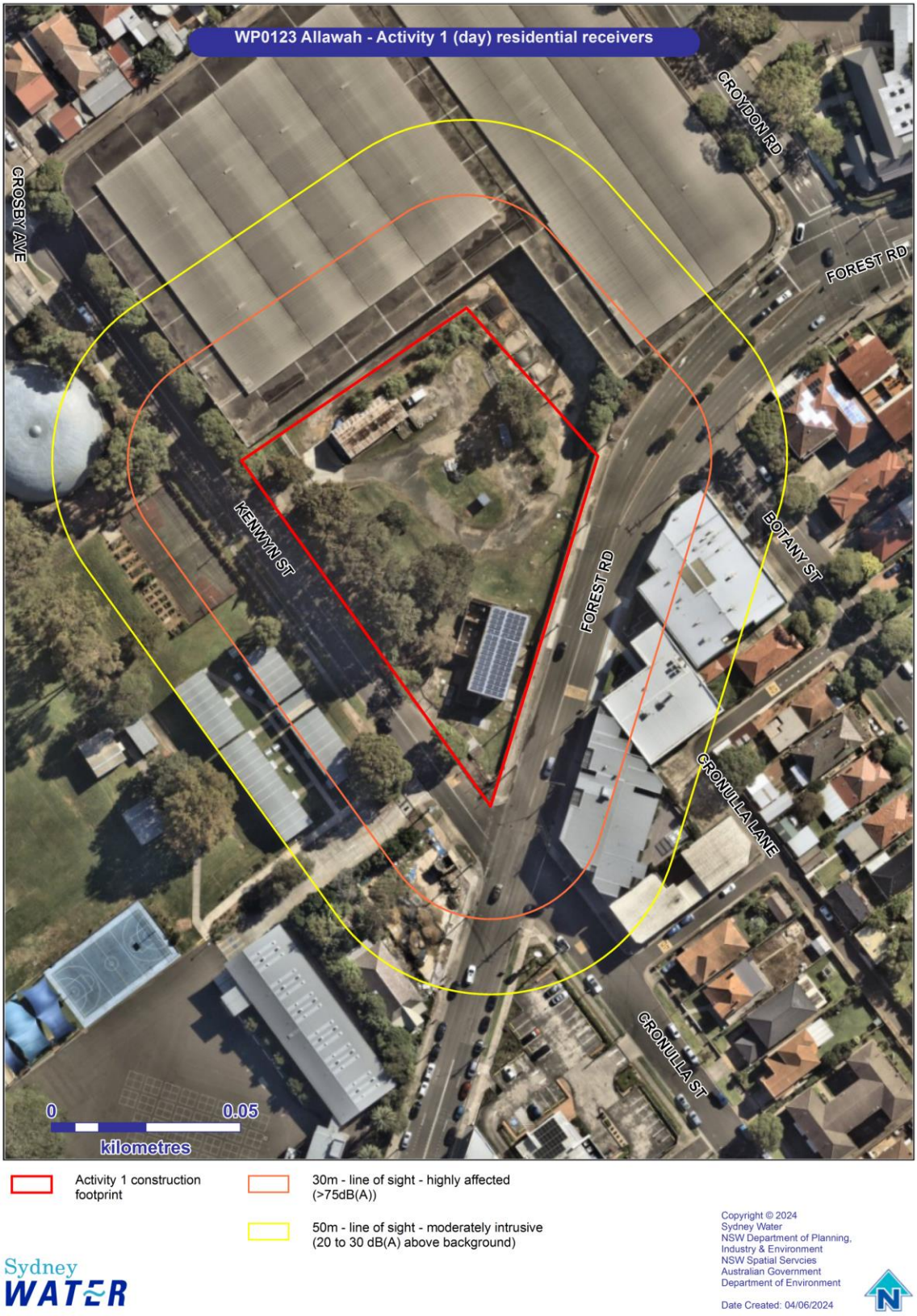

Figure 5 Residential receivers within affected distances during Standard Construction Hours (day)

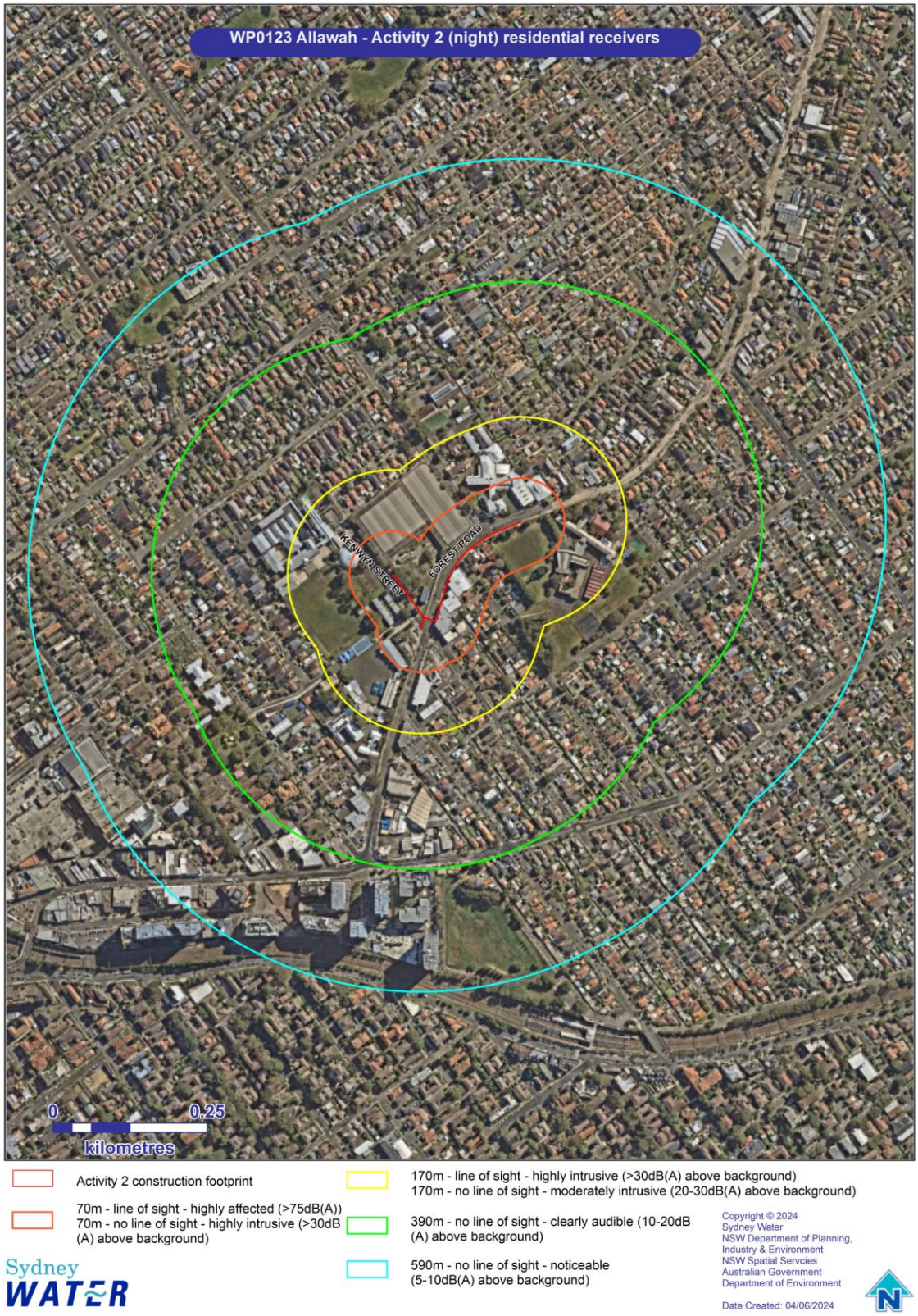

Figure 6 Residential receivers within affected distances during out of hours (night)

5 Environmental mitigation measures

Table 5 Mitigation measures

Mitigation measures	
General	
1.1	Sydney Water's Project Manager (after consultation with the environmental and community representatives and affected landowners) can approve temporary ancillary construction facilities (such as compounds and access tracks), without additional environmental assessment or approval if the facilities 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 Delivery Contractor must demonstrate in writing how the proposed ancillary facilities meet these principles. Any facilities that do not meet these principles will require additional environmental impact assessment. The agreed location of these facilities must be shown on the CEMP site plan and appropriate environmental controls installed.
1.2	Should the proposal change from the EIA, no further environmental assessment is required provided the change: • remains within the study area for the EIA and has no net additional environmental impact; or • is outside the study area for the EIA but: - reduces impacts to biodiversity, heritage or human amenity; or - avoids engineering (for example, geological, topographical) constraints; and - after consultation with any potentially affected landowners and relevant agencies. The Delivery Contractor must demonstrate in writing how the changes meet these requirements, for approval by Sydney Water's Project Manager in consultation with the environmental and community representatives.
1.3	Prepare a Construction Environmental Management Plan (CEMP) addressing the requirements of this environmental assessment. The CEMP should specify licence, approval and notification requirements. Prior to the start of work, all project staff and contractors will be inducted in the CEMP. The CEMP must be readily available on site and include a site plan which shows: • Go/no go areas (vegetation not to be removed). Mark the boundary with highly visible non-ground-disturbing and 'environmental protection zone' signs, and boundaries of the work area including locations of lay-down and storage areas for materials and equipment • location of environmental controls (such as erosion and sediment controls, fences or other measures to protect vegetation or fauna, spill kits) • location and full extent of any vegetation disturbance. The CEMP will identify appropriate delineation with (eg white flagging for construction zone, red flagging for no go zones etc). Delineate approved disturbance boundary (or use EIA terminology) before construction.
1.4	Prepare an Incident Management Plan (IMP) outlining actions and responsibilities during: • predicted/onset of heavy rain during works • spills • unexpected finds (eg heritage and contamination) • other potential incidents relevant to the scope of works.

	All site personnel must be inducted into the IMP.
1.5	To ensure compliance with legislative requirements for incident management (eg *Protection of the Environment Operations Act 1997)*, Sydney Water's employees and contractors will follow SWEMS0009. Attach SWEMS0009 to the CEMP.
1.6	Promptly notify the Project Manager, Community Relations Representative (Program Delivery) and Environmental Representative (Program Delivery) of any complaints.
1.7	Assign single person with accountability for coordinating communication and information flow across contractors and consultants and provide the contact details of this person in the EWMS and/or CEMP.
1.8	The Utility/Contractor must provide Georges River Council with a Land Access notice prior to the commencement of works on Council managed roads. The Delivery Contractor must be covered by public liability insurance to cover potential damage to underground services. Final restorations of all of its disturbed assets are to be completed by Council. At the completion of works the Utility/Contractor must provide Council a Restoration Order with details of the openings that are to be restored.
Topography, geology and soils	
2.1	Prevent sediment moving offsite in accordance with Managing Urban Stormwater, Soils and Construction, Volume 1 and 2A (Landcom 2004 and DECC 2008), including, but not limited to: • divert surface runoff away from disturbed soil and stockpiles • install sediment and erosion controls before construction starts • reuse topsoil where possible and stockpile separately • inspect controls at least weekly and immediately after rainfall • rectify damaged controls immediately • remove controls once surfaces have been stabilised, including removing trapped sediment in drainage lines. Include a Stockpile Management Plan (SMP) as part of the SWMP to adequately manage any proposed temporary and permanent stockpiles. This will include detail on: • exact location of stockpiles • minimising stockpile size • height, slopes and batters • preventing mixing and cross contamination • consideration of future maintenance • capping • erosion and sediment control • restoration. The 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 the Contamination and Hazardous Materials team .
2.2	Minimise ground disturbance and stabilise disturbed areas progressively.
2.3	Georges River Council managed roads, paved footpaths and concrete vehicular crossing trenches must be backfilled with clean fill sand and compacted with fine crushed rock.
2.4	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.
2.5	Stop work in the immediate vicinity of suspected contamination. Indicators of contamination include discoloured soil, anthropogenic material within fill, asbestos, chemical or petrol odours and leachate. Contain disturbed material on an impermeable surface and cordon areas off. Notify the Sydney Water Project

	Manager and the Environmental Representative (who will contact the Contamination and Hazardous Materials team) to agree on proposed management approach.
2.6	Stop work during heavy rainfall or in waterlogged conditions when there is a risk of sediment loss off site.
2.7	Sweep up any sediment/soil transferred off site at least daily, or before rainfall.
2.8	Eliminate ponding and erosion by restoring natural landforms to the pre-works condition.
2.9	Further testing and analysis will be completed prior to construction to confirm if acid sulfate soils are present and require management/ treatment.
2.10	Manage acid sulfate soils in accordance with the Acid Sulfate Soils Management Advisory Committee: Acid Sulfate Soils Assessment Guidelines (ASSMAC, 1998). Prepare an Acid Sulfate Soils Management Plan (ASSMP) (if required).
Water and Drainage	
3.1	Use appropriate controls to avoid potential sedimentation to waterbodies (eg drain protection).
3.2	Bund potential contaminants and store on robust waterproof membrane, away from drainage lines.
3.3	Keep functioning spill kit on site for clean-up of accidental chemical/fuel spills. Keep the spill kits stocked and located for easy access.
3.4	Locate portable site amenities, chemical storage and stockpiles of erodible materials away from watercourses, drainage lines and flood prone areas.
3.5	During the works, stockpiles are to be kept to a minimum to ensure that off-site disposal or adequate mitigation measures to prevent sedimentation of waterways can be established in the event of a large flood warning.
3.6	If the potential for intercepting groundwater is identified after the REF is determined, Sydney Water will obtain a groundwater Water Supply Works Approval. 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).
3.7	Discharge all water in accordance with Sydney Water's Water Quality Management During Operational Activities Policy (D0001667) including erosion controls, discharge rate, dechlorination, monitoring. Re-use potable / groundwater water where possible.
3.8	Dewater excavations in accordance with the Program Delivery Guidance Standard 9.1 Excavation Dewatering (ENV-GS-001).
3.9	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.
3.10	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.
3.11	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.
3.12	Conduct any equipment wash down within a designated washout area.
3.13	Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak-free item.
Flora and fauna	
4.1	Vegetation trimming or clearing will be limited to the areas assessed in this REF. Removal of hollow-bearing trees will be avoided where possible.

4.2	Provided it is essential for delivering the project, Sydney Water's Project Manager can approve the following vegetation removal and tree trimming, without additional environmental assessment (but only after consultation with the Environmental and Community Representatives and affected landowners). Sydney Water considers vegetation removal in these circumstances has minimal environmental impact. • Any minor: - vegetation trimming or - removal of exotic vegetation or - removal of planted native vegetation where the vegetation is not a threatened species (including a characteristic species of a threatened community or population), heritage listed, in declared critical habitat or in a declared area of outstanding biodiversity value. • Any removal of remnant vegetation where there is no net change to environmental impact (eg a different area of vegetation is removed but the total area is the same or less than assessed in this REF). Written explanation of the application of this clause (including justification of the need for trimming or removal and any proposed revegetation) should be provided when seeking Project Manager approval. Any impacts to native vegetation and trees must be offset in accordance with the Biodiversity Offset Guideline (SWEMS0019.13).
4.3	During detailed design and construction planning, explore opportunities to retain the 3 hollow bearing trees on site. This may include adjusting construction methodology (eg hand excavate, implement exclusion fencing) to protect these trees.
4.4	Residual impacts to native vegetation and trees will be offset in accordance with the Biodiversity Offset Guideline (SWEMS0019.13). Potential offsetting areas identified in this REF should be considered. These areas will require appropriate biosecurity management to address weed incursion prior to offsetting.
4.5	Georges River Council will be engaged prior to construction to discuss potential offset replanting options outside of the Allawah Water Pumping Station.
4.6	Map and report native vegetation clearing greater than 0.01 ha in extent (and any associated rehabilitation) to the Sydney Water Environmental Representative. Track vegetation clearing as per SWEMS0015.26 Contractor Native Vegetation Clearing and Rehabilitation template.
4.7	Minimise vegetation clearance and disturbance. Where possible, limit clearing to trimming rather than the removal of whole plants.
4.8	Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing.
4.9	Protect trees outside of the approved vegetation impact area in accordance with the requirements of Australian Standard 4970-2009 for the Protection of Trees on Development Sites. Do not damage tree roots unless absolutely necessary, and engage a qualified arborist where roots >50mm are impacted within the Tree Protection Zone.
4.11	Inspect vegetation for potential fauna prior to clearing or trimming through a pre-clearance survey conducted by a suitably qualified ecologist. If fauna is present, engage WIRES or a licenced ecologist to relocate fauna before works commence.
4.12	If native fauna is encountered on site, stop work and allow the fauna to move away unharassed. Engage WIRES or a licenced ecologist if assistance is required to move fauna.
4.13	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.
4.14	If any damage occurs to vegetation outside of the disturbance boundary (as shown in the CEMP), notify the Sydney Water Project Manager and Environmental Representative so that appropriate remediation strategies can be developed.

4.15	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 SWEMS0017.
4.16	Bag all plant parts and excavated topsoil that may be infested with weed propagules and dispose at a licensed waste disposal facility.
4.17	If replanting near Sydney Water pipelines refer to '*Which trees can damage wastewater pipes?'* link from Sydney Water website.
4.18	In TOBAN period: A Total Fire Ban Exemption is required for all non-essential work in TOBAN periods. Staff and contractors should use the Sydney Water Total Fire Ban Exemption Framework to determine exemption permissibility and approval pathway.
Air and energy	
5.1	Use alternatives to fossil fuels where practical and cost-effective.
5.2	Track energy use as per SWEMS0015.28 Contractor NGER template.
5.3	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.
5.4	Switch off vehicles/machinery when not in use.
5.5	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.
5.6	Cover all transported waste.
Waste Generation	
6.1	A Waste and Resource Recovery Plan (WRRP) must be prepared to appropriately manage and classify any materials including soils, construction/demolition wastes and associated stockpiles. The plan will be prepared by the Delivery Contractor (or nominated environmental consultant) and approved by the Sydney Water Project Manager in consultation with the Environmental Representative and the Contamination and Hazardous Materials team .
6.2	Manage waste in accordance with relevant legislation and maintain records to show compliance eg waste register, transport and disposal records. Record and submit SWEMS0015.27 Contractor Waste Report.
6.3	Provide adequate bins for general waste, hazardous waste and recyclable materials.
6.4	Minimise stockpile size and ensure delineation between different stockpiled materials.
6.5	Minimise the generation of waste, sort waste streams to maximise reuse/recycling in accordance with the *Waste Avoidance and Resource Recovery Act 2001*.
6.6	Manage waste and excess spoil in accordance with the NSW EPA Resource Recovery Orders and Exemptions (if applicable) and / or Waste Classification Guidelines. Where materials are not suitable or cannot be reused onsite or offsite, recycle soils at a licensed soil recycling facility or dispose at an appropriately licenced landfill facility.
6.7	Prevent pollutants from escaping including covering skip bins.

6.8	Dispose excess vegetation (non-weed) that cannot be used for site stabilisation at an appropriate green waste disposal facility.
6.9	If fibro or other asbestos containing material is identified, restrict access and follow Sydney Water's Asbestos Management – Minor Works procedure, Document Number 746607 and SafeWork NSW requirements. Contact Sydney Water Project Manager (who will consult with the Contamination and Hazardous Materials team propertyenvironmental@sydneywater.com.au).
6.10	Review existing hazardous building materials (HBM) report and implement relevant safeguards. Conduct hazardous materials survey prior to commencement where works could impact hazardous materials not surveyed in previous HBM assessments.
Heritage	
7.1	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.
7.2	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.
7.3	Investigations including service location will be undertaken prior to construction to determine the depth of the Woronora Penhurst Pipeline (listed on the Sydney Water s.170 Heritage Register). Less vibration intensive methodologies such as non-destructive digging will be used within the Woronora Penhurst Pipeline curtilage to ensure that excavation does not damage the structure.
7.4	All site personnel must undertake a site specific heritage induction before starting work. The induction should include clear explanation of heritage constraints and the significance of the Allawah Reservoir (WS0001) and Woronora Penhurst Pipeline, processes and measures to avoid impacts, stop work procedures, and contact details to obtain further heritage guidance if needed.
Noise and vibration	
8.1	Works must comply with the EPA Construction Noise Guideline (Draft, 2020), including scheduling work and deliveries during standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturday. No work to be scheduled on Sunday nights or public holidays. Any proposed work outside of these hours must be justified. The Proposal will also be carried out in accordance with: • Sydney Water's Noise Management Procedure SWEMS0056 • Noise Policy for Industry (EPA, 2017). All reasonable and feasible noise mitigation measures should be justified, documented and implemented on-site to mitigate noise impacts.

8.2	Incorporate **standard daytime hours noise management safeguards** into the CEMP, including but not limited to:
	• identify and consult with the potentially affected receivers prior to the commencement:
	  ○ describe the nature of works; the expected noise impacts; approved hours of work; duration, complaints handling and contact details.
	  ○ determine need for, and appropriate timing of respite periods (eg times identified by the community that are less sensitive to noise such as mid-morning or mid-afternoon for works near residences)
	• implement a noise complaints handling procedure
	• plant or machinery will not be permitted to warm-up near residential dwellings before the nominated working hours.
	• appropriate plant will be selected for each task, to minimise the noise impact (eg all stationary and mobile plant will be fitted with residential type silencers)
	• engine brakes will not be used when entering or leaving the work site(s) or within work areas.
	• regularly inspect and maintain equipment in good working order
	• arrange work sites where possible to minimise noise (eg generators away from sensitive receivers, site set up to minimise use of vehicle reversing alarms, site amenities and/ or entrances away from noise sensitive receivers).
	• use natural landforms/ mounds or site sheds as noise barriers

	• schedule noisy activities around times of surrounding high background noise (local road traffic or when other noise sources are active).
8.3	As works **beyond standard daytime hours are needed**, the Delivery Contractor will: • consider potential noise impacts and: implement the relevant standard daytime hours safeguards; Sydney Water's Noise Management Code of Behaviour (SWEMS0056.01) and document all reasonable and feasible management measures to be implemented • identify additional community notification requirements and outcomes of targeted community consultation • seek approval from the Sydney Water Project Manager in consultation with the environment and communications representatives.
8.4	As **night works are needed,** the Delivery Contractor will: • consider potential noise impacts and implement the relevant standard daytime and out of hours safeguards and document consideration of all reasonable and feasible management measures • identify community notification requirements (ie for scheduled night work (not emergency works)), • notify all potentially impacted residents and sensitive noise receivers not less than one week prior to commencing night work. • seek approval from the Sydney Water Project Manager in consultation with the environment and communications representatives.
8.5	If works on **Sundays or public holidays are required**, the Delivery Contractor would: • justify why all other times are not feasible • consider potential noise impacts and, implement relevant standard daytime, out of hours and night-time safeguards and other reasonable and feasible management measures • identify community notification requirements • seek approval from the Sydney Water Project Manager in consultation with the environment and communications representatives.
8.6	Where possible, the use of noise intensive equipment (e.g. excavator with hammer) will be used prior to midnight.
8.7	Carry out ongoing community engagement on an ad-hoc basis, including regular follow-ups (ie one-on-one meetings, emails, texts, phone discussions) for sensitive receivers / highly impacted residents.
8.8	Send regular project update newsletters to surrounding community and key stakeholders fortnightly (or as required).
8.9	Complete an Out of Hours Work Plan (OHWP) in advance of work starting.
8.10	Incorporate daily register of planned site activities as part of the site diary entry and pre-start meetings, to discuss potential community and environmental issues and mitigation measures.
8.11	Undertake attended and/or unattended noise monitoring to evaluate construction noise if complaints are received.
8.12	For high impact noise affected residents, identified during community engagement consultation, the following provisions may apply: • earplugs for night work • vouchers/gift cards to allow respite away from the property.
8.13	Notification must be undertaken in accordance with Table 8 of Appendix E of this REF. Notification may consist of using a 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.
8.14	Specific notifications, letterbox drops (or equivalent) to highly affected receivers no later than five working days ahead of night works (Activity 2) must be undertaken in accordance with Table 8 of Appendix E of this REF. The specific notification provides additional information when relevant and informative to more highly affected receivers than covered in general letterbox drops.
8.15	Where appropriate, phone calls detailing relevant information will be made to highly affected receivers, who have provided their contact details, within seven calendar days of construction start. Phone calls must be

	undertaken in accordance with Table 8 of Appendix E of this REF. Where the resident cannot be telephoned then an alternative form of engagement should be used.
8.16	Duration respite should be considered in accordance with Table 8 of Appendix E of this REF. 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. However, community consultation will inform appropriate respite periods.
8.17	The Community Engagement Advisor will consult the community and liaise with project team to determine if alternative accommodation is required following review of all available noise mitigation and management measures.
8.18	Conduct a dilapidation survey / asset condition assessment prior to works which have potential to damage existing structures.
8.19	Monitor compliance with the recommended vibration levels in BS 7385:2-1993: Evaluation and measurement for vibration in buildings Guide to damage levels from groundborne vibration and DIN 4150-3 1999: Structural Vibration – Part 3; Effects of vibration on structures. Attended vibration measurements are undertaken at the commencement of the works to verify the site-specific minimum working distances and/or confirm that damage screening criteria are not exceeded.
8.20	Where predicted vibration levels exceed the human comfort objectives outlined in the *Construction Noise and Vibration Guideline* (TfNSW, 2023), the procedures in Section 7 of this guideline are to be followed.
8.21	Consider less vibration intensive methodologies where practicable and use only the necessary sized and powered equipment.
Traffic and access	
9.1	Prepare a Traffic Management Plan (TMP) in consultation with the relevant traffic authority. Meet NSW Roads and Maritime Service's Traffic Control at Worksites Manual v5 requirements for TfNSW roads. The Delivery Contractor will obtain a Road Occupancy Licence (ROL) from TfNSW, including if works are within 100m of traffic signals when construction commences.
9.2	Minimise traffic impacts near residential properties, schools and businesses by consulting with them (eg no major materials deliveries during peak periods including school drop off or pick up times etc.).
9.3	Manage sites to allow people to move safely past the works, including alternative pedestrian, bicycles, pram and wheelchair access.
9.4	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.
9.5	Erect signs to inform road users of the proposed works and any temporary road closures.
9.6	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.
9.7	Sydney Water to coordinate works (including vehicle movements) within the Allawah Water Pumping Station (WP0123).
Social and Visual	
10.1	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.
10.2	Work sites will be restored to pre-existing condition or better. Restoration of council infrastructure will be done in consultation with the relevant council.
10.3	Minimise visual impacts (eg retain existing vegetation where possible).
10.4	Direct artificial light away from sensitive receivers where possible (ie residents, fauna or roadways).

10.5	Maintain work areas in a clean and tidy condition.

References

D4C 2022a, Allawah WPS WP0123 HV renewal – Geotechnical interpretive report, 18 October.

D4C 2022b, WP0123 Allawah high voltage assets renewal - Interpretive contamination report, 25 July.

Appendix A – Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	There may be temporary impacts on the community from noise and traffic during construction. There will also be some longer-term visual impacts due to the removal of vegetation.
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 trees to be removed are planted and their removal is not considered a significant impact on native ecosystems. Replanting will offset potential impacts.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposed work will result in some reduction of the aesthetic value of the immediate locality as the new switchroom and transformer yard will replace vegetation. However, the new infrastructure will be consistent with the built form of other buildings on the site. Visual impacts are expected to be experienced by a low number of receivers (school) opposite the site. The proposal will not reduce the recreational, scientific or other environmental quality or value of the locality.
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	The proposal will not have any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations. Mitigation measures will protect heritage sites.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposed work may require the removal of 3 hollow bearing trees, however this will not have a significant impact on the habitat of protected animals. Vegetation removal required for the proposal will be offset under Sydney Water's biodiversity offset guide.
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	The proposal will not be endangering any species of animal, plant or other form of life, whether living on land, in water or in the air.
Any long-term effects on the environment	Vegetation and potential habitat removal will be offset under Sydney Water's biodiversity offset guide. The proposal will not have any long-term impacts on the environment.
Any degradation of the quality of the environment	The proposed works would alter the visual character of the environment over the long-term from the new infrastructure and tree removal. However, visual impacts are expected to be experienced by a low number of receivers. Tree removal would

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	also result in a minor impact to the quality of the environment in the proposal area, however this will be offset by replanting.
Any risk to the safety of the environment	The proposal will not increase risk to the safety of the environment.
Any reduction in the range of beneficial uses of the environment	The proposal will not reduce the range of beneficial uses of the environment.
Any pollution of the environment	The proposal would cause noise pollution to surrounding receivers during construction. The noisiest equipment would not be used for the entire construction duration and HV cabling works would move progressively along the alignment. Environmental mitigation measures will be implemented to minimise noise impacts.
Any environmental problems associated with the disposal of waste	Waste disposal will be in accordance with the environmental mitigation measures, and no environmental problems associated with the disposal of waste are expected.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposal will not increase demand on resources, that are, or are likely to become, in short supply.
Any cumulative environmental effect with other existing or likely future activities	The proposal will not have any cumulative environmental effect with other existing or likely future activities.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The proposal will not have any impact on coastal processes or hazards, and coastal processes and coastal hazards will not have any impact on the 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 renewals program.
Any other relevant environmental factors.	There are no other relevant environmental factors to consider.

Appendix B – 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 there is no scientific uncertainty relating to the proposal. The environmental impacts of construction would be minor and localised.
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.
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 will have minimal impact on biological diversity and ecological integrity. Offset replanting will mitigate the temporary loss of up to 30 trees.
Improved valuation, pricing and incentive mechanisms - *environmental factors should be included in the valuation of assets and services, such as 'polluter pays', the users of goods and services should pay prices based on the full life cycle costs (including use of natural resources and ultimate disposal of waste) and environmental goals*	The proposal will provide cost efficient use of resources and provide optimum outcomes for the community and environment.

Appendix C – Consideration of TISEPP consultation

TISEPP section	Yes	No
Section 2.10, council related infrastructure or services – consultation with council		
Will the work:		
Potentially have a substantial impact on stormwater management services provided by council?		✓
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?		✓
Involve excavation of the surface of, or a footpath adjacent to, a road for which the council is the roads authority that is not minor or inconsequential?	✓	
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 (ie non-certified land)? *If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).*		✓