Review of Environmental Factors

Belrose Reservoir Refurbishment

Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of Belrose Reservoir Refurbishment. 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 substantially 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 is neither false nor misleading.

Prepared by:	Reviewed and endorsed by:	Endorsed by:
[redacted] Andrea Glass Environmental Scientist Sydney Water Date: 14/05/2025	[redacted] John Eames Senior Environmental Scientist Sydney Water Date: 15/05/2025	[redacted] Giovanni Boggio Project Manager Sydney Water Date: 29/05/2025

Decision Statement

The main potential construction environmental impacts of the proposal include impacts to flora, noise amenity and traffic. No impacts are anticipated during operation. 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:	[redacted]	Murray Johnson Senior Manager Environment and Heritage Sydney Water Date: 13/06/2025

1. Proposal description

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

Aspect	Relevance to proposal
Proposal need and objectives	This proposal is part of the reservoir renewals program. The program is required to meet Sydney Water's commitment to ensure ongoing safety and security of water supply. The site includes 2 reservoirs: WS0155 and WS0282. The objectives of the proposal are to: • Protect public health and the environment by improving reliability of the reservoir • Improve chemical dosing to the reservoirs. The reservoirs capacities would not increase as a result of this proposal.
Proposal description and methodology	The proposal involves the refurbishment of WS0155 and WS0282 and installation of 2 chemical dosing units (CDU). The methodology of the proposal includes: • Site establishment including the installation of site compounds and vegetation trimming and removal • Civil works including the excavation and installation of permanent services including an access path, drain and hardstand for the CDUs • Demolition works and disposal of redundant assets including pipes, reservoir roof infrastructure and hazardous building materials • Repairs and remediation works including abrasive blasting, relining of the reservoirs • Installation of new roof structures including but not limited to internal columns, handrails, hatches, ventilations, electrical and instrumentation • Site demobilisation. Indicative plant and equipment to be used for the proposal: • Ablution sediment tank • Air compressors • Automated dosing system • Compaction roller • Compactor • Concrete agitator trucks • Concrete pumps • Concrete saws

Aspect	Relevance to proposal
	• Confined spaces safety equipment (e.g. gantry/davit) • Cranes/other lifting equipment (100t or greater) • Elevated work platform • Enclosed fuel cells • Enclosed generators • Excavators (13t or greater) • Hand tools • Jackhammers • Light vehicles • Scaffold • Site facilities and amenities • Skip bins • Storage containers • Street sweeper • Tip trucks • Vac-Truck.
Consideration of alternatives/options	Two roof layout options were considered for the proposal: • Option 1 – Grid arrangement • Option 2 – Radial arrangement. Option 2 was identified as the preferred option as it aligned with the proposal's objectives and is the most cost-effective of the options, while maintaining the asset based on its service requirement.
Location and land ownership	The street address of the site is 209 Forest Way, Belrose. The site is in the Northern Beaches Local Government Area. The land is owned by Sydney Water. Relevant lot and DPs include: • Lot 2 DP87700 • Lot 5 DP700298 • Lot 7 DP700298 • Lot 50 DP1218509 • Lot 51 DP1218509.

Aspect	Relevance to proposal
Site establishment and access tracks	The site would be accessed from Forest Way along an existing access track. Site establishment would include vegetation clearance and installing temporary site amenities.
Ancillary facilities (compounds)	Construction compounds will likely be required to house site sheds, construction amenities and materials laydown. During the design phase, the location of compounds and access tracks could not be confirmed. The exact location of these will be chosen by the contractor and remain within the site, in consultation with and approved by Sydney Water's Project Manager as described in the mitigation measures in Table 4-2.
Work hours	Work and deliveries will be scheduled during standard daytime hours: • 7 am to 6 pm, Monday to Friday • 8 am to 1 pm, Saturdays. The proposal is not expected to require work outside these hours. However, Sydney Water's Project Manager can approve work outside of standard daytime hours. The approval process is described in the mitigation measures in Table 4-2.
Proposal timing	Construction is expected to start late 2025 and take about 25 months.

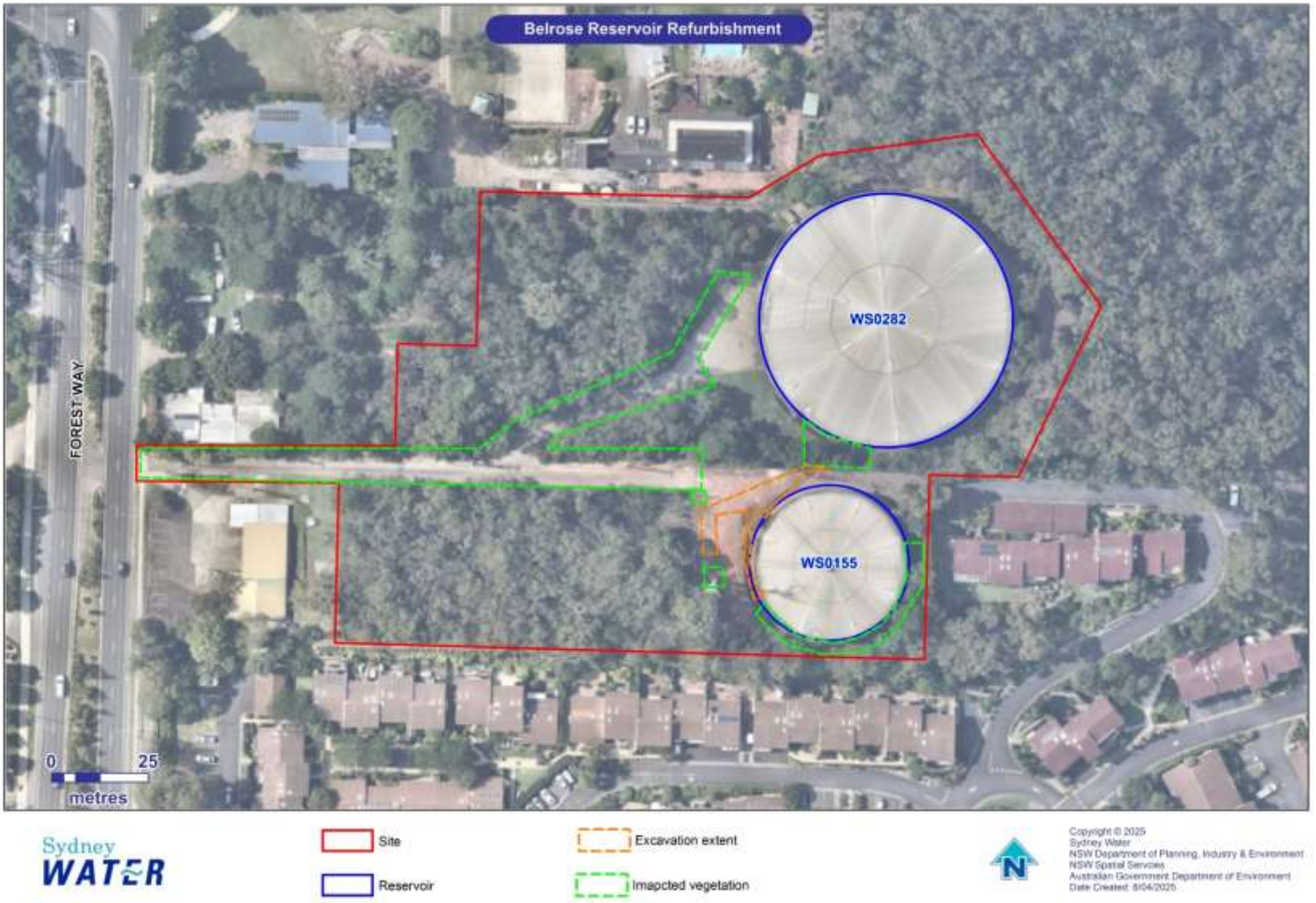

Figure 1 Location of proposal and key environmental constraints

2. Consultation

2.1 Community and stakeholder consultation – general

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

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

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

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

We will also provide local council with reasonable notice when we would like to commence works. Local council will be consulted about matters identified in environmental planning instruments such as public safety issues, temporary works on council land, and full or partial road closures of council managed roads.

2.2 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. This is specified in the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP).

No formal consultation was required under the TISEPP. Further detail is provided in Appendix C.

3. Legislative requirements

Table 3-1 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Warringah Local Environmental Plan 2011	The proposal is located on land zoned DM Deferred Matter.
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Section 2.159 of the TISEPP permits development by or on behalf of a public authority for water reticulation systems without consent on any land. Section 2.158 of the TISEPP defines that water reticulation systems also include water supply reservoirs. As Sydney Water is a public authority, the proposal is permissible without consent.

Table 3-2 Consideration of key environmental legislation

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Protection of the Environment Operations Act 1997 (POEO Act)	An EPL does not apply to the proposal. Chapter 5 of the POEO Act defines different types of pollution incidents. Part 5.7 of the POEO Act specifies the duty to notify harm to the environment where there is actual or potential environmental harm. Should one of these incidents occur during construction, the response and investigation to the incident would follow SWEMS0009 - Responding to incidents with an environmental impact.	N/A	N/A
Biodiversity Conservation Act 2016 (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)	The proposal requires the trimming and removal of trees associated with BC Act listed endangered ecological community: Duffys Forest Ecological Community in the Sydney Basin Bioregion. The proposal is not anticipated to have a significant impact on flora and fauna when managed in accordance with mitigation measures in Table 4-2.	REF	Pre-construction, Sydney Water
Water Act 1912 / *Water Management Act 2000*	If groundwater removal is required, a Water Supply Works Approval (WSWA) is required before any groundwater dewatering.	N/A	N/A

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Roads Act 1993	Temporary traffic control may be required during construction to allow for deliveries. Forest Way Drive is a State road and managed by Transport for NSW. Consultation will be undertaken with Transport for NSW before construction starts to obtain a Road Occupancy Licence in accordance with section 138 of the Act.	Road Occupancy Licence	Pre-construction, contractor

4. Environmental assessment

The environmental impacts checklist (SWEMS0019.01) was considered for the proposal. Table 4-1 includes only the potentially impacted aspects and Table 4-2 lists mitigation measures.

Table 4-1 Review of environmental aspects

Aspect	Potential impacts
Topography, geology and soils	The topography of the site ranges from 198 to 194 metres Australian Height Datum. No areas of acid sulphate soils or salinity have been recorded within the site. Excavation would be required for the installation of the CDUs, associated infrastructure and a path around the reservoir if required. In a worst case scenario, excavations would be up to two metres deep and limited to the site. Local topography would not be substantially altered once operational when excavations have been filled in. There is the potential for soil to become contaminated through accidental chemical or fuel spills and leaks from construction plant and equipment, and maintenance activities during operation. Potential topography, geology and soil impacts will be managed by implementing the safeguards listed in Table 4-2.
Water and drainage	There are no waterways or potential groundwater dependent ecosystems within 200 metres of the site. Before replacing the reservoir roof, the water in the reservoir would be reduced to a low level through customer use of water. The remaining water would then be dewatered into the environment via an existing scour. Water will be discharged in accordance with Sydney Water's discharge protocol to prevent any water quality impacts. Groundwater is not anticipated to found during construction works however if encountered it may need to be removed. A WSWA must be obtained before groundwater dewatering begins. The proposal will require temporary storage of fuels and/or chemicals for equipment and machinery operation during construction and operation. Potential impacts include accidental leaks, spills and seepage into the soils or stormwater system. Any fuels and chemicals required to be stored on site will be securely bunded. Potential impacts to water and drainage will be managed by implementing the mitigation measures listed in Table 4-2.
Flora and fauna	A Biodiversity Assessment Report (BAR) was completed in June 2024 by AEP (refer Appendix D). Within the site, plant community type Sydney Coastal Sandstone Bloodwood Shrub Forest was identified (PCT 3593). PCT 3593 is associated with BC Act listed endangered ecological community: Duffys Forest Ecological Community in the Sydney Basin Bioregion. No fauna was identified within the site. The BAR identified one threatened orchid species listed as Endangered under both the BC Act and EPBC Act, Bauer's Midge Orchid (*Genoplesium baueri).* As the field surveys for the BAR were undertaken outside of the peak flowering period for the species, the BAR recommended that a targeted survey for the species should be undertaken during the flowering period (February-March) to determine if the species is present within the site. Therefore Aurecon undertook a targeted surveys for

Aspect	Potential impacts
	Bauer's Midge Orchid within the peak flowering season to confirm its presence within the site. Refer to Appendix E for the orchid memorandum. The targeted survey did not identify any orchids within the area impacted by the proposal. The orchid memorandum undertaken by Aurecon confirmed the presence of the BC Act listed endangered ecological community: Duffys Forest Ecological Community in the Sydney Basin Bioregion (Duffy's Forest TEC) within the area to be impacted by the proposal, therefore a Test of Significance was undertaken (refer to Appendix F). The proposal would result in removal of approximately 0.061 ha of Duffy's Forest TEC. This includes 0.006 ha of 'underscrubbed' condition TEC, 0.04 ha of 'good' condition TEC and 0.015ha of 'moderate' condition TEC. Native vegetation within the site is fragmented by existing road and infrastructure, previously disturbed with illegal rubbish dumping, and with moderate weed incursion. Therefore, the Test of Significance concluded that impacts to the TEC as a result of the proposal are unlikely to be considered significant. Offsetting will be completed in line with the Sydney Water Biodiversity Offset Guide (2024). The impact to the TEC is considered to be moderate therefore the offset multiplier to be used is 3:1. As 0.061 ha of Duffy's Forest TEC would be impacted, 0.183 ha offsets are required. With the implementation of mitigation measures in Table 4-2 and the minor nature of the proposed works, it is unlikely that the proposal would result in a significant flora or fauna impact.
Heritage	There are no known non-Aboriginal or Aboriginal heritage items within 200 metres of the site, therefore no impacts to known heritage is expected. The site has been highly disturbed by the construction of the reservoirs, therefore the potential to impact unidentified Aboriginal heritage items is very low. Potential impacts to heritage will be managed by implementing the mitigation measures listed in Table 4-2.
Noise and vibration	**Noise** The proposal is within a residential setting. The existing noise environment is influenced by road traffic. Sensitive receivers who may be impacted by noise from the works includes residents immediately adjacent to the site. The noisiest works would include the abrasive blasting within the reservoirs. Based on the risk profile of the works from Table 2 of the Draft Construction Noise Guideline (EPA, 2020), a quantitative noise assessment was performed for the proposal. The purpose of the noise assessment was to assess the predicted worst-case noise impacts. This identified recommended additional mitigation measures for impacted receivers at different distances from the works, which would guide community engagement for the site. The noise assessment was performed using the Transport for NSW Construction and Maintenance Noise Estimator. The modelled scenarios comprised of the following inputs: • Representative noise environment – R3 • Distance based noisiest plant – abrasive blasting • Line of sight to the receiver – no (behind substantial barrier).

Aspect	Potential impacts
	Noise levels higher than the existing environment during the day would be heard within 25 metres of the proposed works. Residential receivers would be impacted by noise during construction (refer Figure 2). Additional mitigation measures from the Transport for NSW Construction and Maintenance Noise Estimator that should be considered by the community team and contractor are as follows: • N: Notification (letter box drop) • PC: Phone call • RO: Respite offer (e.g. work blocks of 2 hours with one hour breaks in between). No operational noise impacts are anticipated. **Vibration** It is anticipated that the works would involve minor vibratory activities such as the use of an abrasive blaster. There are no structures adjacent to the reservoir that may be impacted to the minor vibratory activities. No vibration impacts are anticipated.
Air and energy	The nearest sensitive receivers which may be impacted by changes to air quality are the residents located adjacent to the site. Dust and pollution impacts may result from: • Dust generated during excavation • Dust generated by construction vehicles travelling on disturbed/ unsealed access routes or on unsealed laydown areas or road verges • Emissions from machinery, equipment and vehicles used during construction. Nearby sensitive receivers may be affected by minor changes in air quality during construction. Air quality impacts would be managed by implementing the mitigation measures listed in Table 4-2. During construction the proposal would require increased energy and this would marginally increase Sydney Water's total energy use. During operation the proposal would be operated in accordance with energy use procedures that apply to Sydney Water's existing network.
Waste and hazardous materials	HazCentral identified asbestos and lead paint within the site. Before construction starts the reservoirs would be inspected for these hazardous materials to confirm their location and appropriate removal of the materials if required. Construction waste streams are anticipated to include: • Redundant assets • Domestic waste • Contaminated materials • Excavated soil • Green waste.

Aspect	Potential impacts
	Waste will be stored in separate skip bins or delineated areas within the compound or taken directly off-site to a facility licenced to accept the waste. Recycling or re-use of waste streams such as green waste and concrete is encouraged where possible. Waste and hazardous materials would be managed by implementing the mitigation measures listed in Table 4-2.
Traffic and access	The site is accessed from the southbound lane on Forest Way, a State road managed by Transport for NSW. Partial road closures may be required for the infrequent delivery and pick of materials and equipment. Traffic management would be undertaken to minimise delays where possible. At peak construction, up to 18 light vehicles and some vehicles would access the site per shift. All vehicles would be parked within the site. Access to nearby residential properties, the Rural Fire Brigade and existing Sydney Water assets would be maintained. Traffic and access would be managed by implementing the mitigation measures listed in Table 4-2.
Social and visual	The proposal has the potential to cause social impacts associated with air quality and noise, which have been assessed above. Visual impacts from the loss of vegetation and presence of construction personnel and equipment are anticipated. The impacts to visual amenity during operation would be limited. The new roof would be like for like and the additional infrastructure, such as the new CDUs, are consistent with the existing use of the site. Retained vegetation would screen the additional infrastructure at the site from nearby residents. Social and visual impacts would be managed by implementing the mitigation measures listed in Table 4-2.
Cumulative and future trends	Sydney Water will coordinate the works with the operations at the site to ensure cumulative impacts within the site and to the community are low. Sydney Water is not aware of any planned or future work that will overlap with these works being performed. Development applications currently (March 2025) active or determined in the last 6 months for the suburb of Belrose relate to localised residential developments and changes to existing buildings. Overall, potential impacts of the proposed works are expected to be minor and localised. Potential impacts are unlikely to make a significant contribution to any cumulative environmental impact on a local or regional scale.

Figure 2 Noise impacts

Table 4-2 Mitigation measures

Mitigation measures
General
Sydney Water's Project Manager (after consultation with the environmental and community representatives and affected landowners) can approve temporary ancillary construction facilities (such as compounds and access tracks), without additional environmental assessment or approval if the facilities: • limit proximity to sensitive receivers • do not disrupt property access • have no impact to known items of non-Aboriginal and Aboriginal heritage • are outside high risk areas for Aboriginal heritage • use existing cleared areas and existing access tracks • have no impacts to remnant native vegetation or key habitat features • have no disturbance to waterways • do not require additional safeguards beyond those included in the EIA • do not disturb contaminated land or acid sulfate soils • will be rehabilitated at the end of construction. The Delivery Contractor must demonstrate in writing how the proposed ancillary facilities meet these principles. Any facilities that do not meet these principles will require additional environmental impact assessment. The agreed location of these facilities must be shown on the CEMP site plan and appropriate environmental controls installed.

Should the proposal change from the EIA, no further environmental assessment is required provided the change:
• remains within the impact area and has no net additional environmental impact or
• is outside the impact area but:
  ○ reduces impacts to biodiversity, heritage or human amenity or
  ○ avoids engineering (for example, geological, topographical) constraints and
  ○ after consultation with any potentially affected landowners and relevant agencies.
The Delivery Contractor must demonstrate in writing how the changes meet these requirements, for approval by Sydney Water's Project Manager in consultation with the environmental and community representatives.

Prepare a Construction Environmental Management Plan (CEMP) addressing the requirements of this environmental assessment. The CEMP should specify licence, approval and notification requirements. Prior to the start of work, all project staff and contractors will be inducted in the CEMP. The CEMP must be readily available on site and include a site plan which shows: • go/no go areas (e.g. around the previous record of Bauer's Midge Orchid) and boundaries of the impact 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 for the approved impact area before construction.
Prepare an Incident Management Plan (IMP) outlining actions and responsibilities for: • predicted/onset of heavy rain during works

Mitigation measures

- 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.

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

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

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 CEMP.

Topography, geology and soils

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.

Minimise ground disturbance and stabilise disturbed areas progressively.

Delivery Contractor to ensure imported material is Virgin Excavated Natural Materials (VENM) or meets a relevant NSW EPA Resource Recovery Order and Resource Recovery Exemption, or is a commercially supplied material that is not waste.

If using materials that are subject to a NSW EPA Resource Recovery Order/Exemption the Delivery Contractor must ensure the conditions in that Order/Exemption are strictly adhered to.

A construction Asbestos and Lead Management Plan must be prepared by a suitably qualified person as part of the CEMP and reviewed by Sydney Water's Environmental Representative in consultation with Contamination and Hazardous Materials team. The plan must identify the type and location of known/potential contamination, land-owner notification, management requirements (waste minimisation, waste segregation and classification) and reuse, offsite recycling and/or disposal measures.

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.

Water and drainage

Bund potential contaminants and store on robust waterproof membrane, away from drainage lines.

Mitigation measures

Keep functioning spill kit on site for clean-up of accidental chemical/fuel spills. Keep the spill kits stocked and located for easy access.

Keep stockpiles to a minimum and ensure adequate contingency measures are in place to prevent sedimentation of waterways in the event of a large flood event.

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 conditions of the approval (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 Water Quality Management During Operational Activities Policy (D0001667) including erosion controls, discharge rate, dechlorination, monitoring. Re-use potable / groundwater water where possible.

Store all chemicals and fuels in accordance with relevant Australian Standards and Safety Data Sheets. Record stored chemicals on site register. Ensure bunded areas have 110% capacity of the largest chemical container, or an additional 25% capacity of the total volume stored within (whichever is greater). Tightly secure chemicals and fuels in vehicles. Clearly label all chemicals.

Conduct refuelling, fuel decanting and vehicle maintenance in compounds where possible.

Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak-free item.

Flora and fauna

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 (e.g. a different area of vegetation is removed but the total area is the same or less than assessed in the EIA).

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

Offset residual impacts to native vegetation and trees in accordance with the Biodiversity Offset Guideline (SWEMS0019.13).

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.

Mitigation measures

Minimise vegetation clearance and disturbance, including impacts to standing dead trees and riparian zones. Where possible, limit clearing to trimming rather than the removal of whole plants.

Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing.

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).

Protect trees in accordance with the requirements of Australian Standard 4970-2009 for the Protection of Trees on Development Sites. Do not damage tree roots unless absolutely necessary, and engage a qualified arborist where roots >50mm are impacted within the Tree Protection Zone.

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.

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.

To prevent spread of weeds, wrap straw bales in geofabric to prevent seed spread.

Bag all plant parts and excavated topsoil that may be infested with weed propagules and dispose at a licensed waste disposal facility.

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.

No-go zone to be erected around the previous record of Bauer's Midge Orchid. This no-go zone should be fenced off with clear signage. The no-go zone should be regularly checked and maintained during environmental inspections.

If clearing of native vegetation is required outside the impacted vegetation area identified in this REF, these areas will require an additional assessment by an ecologist for potential impacts to threatened ecological communities, threatened species and their habitats.

The native vegetation to be cleared within the impacted vegetation area will be clearly identified and marked. Native vegetation to remain will be clearly delineated as no-go zones to avoid risk of clearing. Clearing and no-go zone maps to be prepared and approved by the Delivery Contractor environmental representative prior to works commencing. Signing stating no-go zone to be placed on fences. All staff will be made aware of no-go zone during induction and be provided with a map of no-go zone.

Mitigation measures

A weed management plan is to be developed and implemented by the contractor and approved by Sydney Water prior to works commencing. The plan will be established and implemented to avoid spread and establishment of weeds during construction. Measures will include:

- All equipment and plant machinery to be appropriately cleaned before the start of works
- All priority weeds within the Impact Area are to be cleared and disposed of at a registered waste management facility.
- If herbicide is to be used, this must be applied by a person trained to do so and that has a certificate of competency, or a statement of attainment issued by a registered training organisation. Herbicide will only be used in accordance with the label/permit
- Conduct toolbox talks to identify high risk priority weeds and weeds of national significance to on-site staff
- Weed vegetation requiring clearing and removal should be disposed of at a registered waste management facility.

Heritage

Do not make publicly available or publish, in any form, Aboriginal heritage information on sites / potential archaeological deposits, particularly regarding location.

Repeat the basic AHIMS search if it is older than 12 months. Conduct additional assessment if new sites are registered and could be impacted by the works.

If any Aboriginal object or non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify Sydney Water Project Manager in accordance with SWEMS0009.

Noise and vibration

Works must comply with the EPA Construction Noise Guideline (Draft, 2021), 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.

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

- Identify and consult with the potentially affected residents prior to commencement of works. This should:
    - 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.
- Do not warm-up plant or machinery near residential dwellings before the nominated working hours.
- Select appropriate plant for each task, to minimise the noise impact (eg all stationary and mobile plant will be fitted with residential type silencers).
- Do not use engine brakes when entering or leaving the work site(s) or within work areas.
- Regularly inspect and maintain equipment in good working order.

Mitigation measures

- 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).

Air and energy

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.

Waste and hazardous materials

Manage waste and hazardous material in accordance with relevant legislation and the Asbestos and Lead Paint Management Plan 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 stockpile size and ensure delineation between different stockpiled materials.

Minimise the generation of waste and sort waste streams to maximise reuse/recycling in accordance with the legislative requirements.

Manage waste and excess spoil in accordance with the NSW EPA Resource Recovery Orders and Exemptions (if applicable) and / or Waste Classification Guidelines. Where materials are not suitable or cannot be reused onsite or offsite, recycle where appropriate. Recycle soils at a licensed soil recycling facility or dispose at an appropriately licenced landfill facility.

Prevent pollutants from escaping including by covering skip bins.

Dispose excess vegetation (non-weed) that cannot be used for site stabilisation at an appropriate green waste disposal facility.

Mitigation measures

Traffic and access

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.

Develop management measure to minimise traffic impacts near residential properties, schools and businesses by consulting with them (e.g. no major materials deliveries at school drop off or pick up times etc.).

Manage sites to allow people to move safely past the works, including alternative pedestrian, bicycle, pram and wheelchair access.

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.

Social and visual

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.
- Treat community enquiries appropriately.

Restore work sites to pre-existing condition or better.

Minimise visual impacts (e.g. retain existing vegetation where possible).

Maintain work areas in a clean and tidy condition.

5. Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of the Belrose Reservoir Refurbishment. The proposal is required to meet Sydney Water's commitment to ensure ongoing safety and security of water supply.

The main potential construction environmental impacts of the proposal include impacts to flora, noise amenity and traffic. No impacts are anticipated during operation. 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 Ecologically Sustainable Development (ESD) (Appendix B). The proposal will result in positive long-term environmental improvements. The proposal will not result in the degradation of the quality of the environment and will not pose a risk to the safety of the environment.

Appendix A – Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	There may be impacts on the community related to flora, noise amenity and traffic. There will be environmental improvements by providing a reliable water service to the local community.
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 Test of Significance for clearing 0.061 ha of Duffy's Forest TEC, concluded that impacts are unlikely to be considered significant. This impact will be mitigated with 0.183 ha offsetting.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposal will not reduce these factors.
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 these factors.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposal will not have any impact on the habitat of protected animals.
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	Targeted surveying for the Bauer's Midge Orchid (Genoplesium baueri) did not identify any orchids within the area impacted by the proposal. No-go zone measures will prevent impacts to previously recorded locations of Bauer's Midge Orchid.
Any long-term effects on the environment	The proposal will not have any long-term impacts on the environment but will have a long-term benefit by providing a reliable and modern water service for the area.
Any degradation of the quality of the environment	The proposal will maintain the quality of the environment.
Any risk to the safety of the environment	The proposal will ensure the safety of the environment.
Any reduction in the range of beneficial uses of the environment	The proposal will maintain the range of beneficial uses of the environment.

Section 171 checklist	REF finding
Any pollution of the environment	Environmental mitigation measures will mitigate the potential for the proposal to pollute the environment. Construction phase air and noise impacts can be effectively mitigated.
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 affect demand on resources.
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 these factors.
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.	The proposal has been assessed against the factors listed above, and there are no other relevant environmental factors to consider.

Appendix B – Consideration of Ecologically Sustainable Development

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.
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.
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?		X
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		X
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		X
Connect to, and use a substantial volume of water from a council owned water supply system?		X
Require temporary structures on, or enclose, a public space under council's control that will disrupt pedestrian or vehicular traffic that is not minor or inconsequential?		X
Excavate a road, or a footpath adjacent to a road, for which the council is the roads authority, that is not minor or inconsequential?		X
Section 2.11, local heritage – consultation with council		
Is the work likely to affect the heritage significance of a local heritage item, or of a heritage conservation area (not also a State heritage item) more than a minor or inconsequential amount?		X
Section 2.12, flood liable land – consultation with council		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and will works alter flood patterns other than to a minor extent?		X
Section 2.13, flood liable land – consultation with State Emergency Services		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and undertaken under a relevant provision*, but not the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance? * (e) Div.14 (Public admin buildings), (g) Div.16 (Research/ monitoring stations), (i) Div.20 (Stormwater systems)?		X
Section 2.14, development with impacts on certain land within the coastal zone– council consultation		
Is the work on land mapped as coastal vulnerability area and inconsistent with a certified coastal management program?		X

TISEPP section	Yes	No
Section 2.15, consultation with public authorities other than councils		
Will the proposal be on land adjacent to land reserved under the *National Parks and Wildlife Act 1974* or land acquired under Part 11 of that Act*? If so, consult with DPE (NPWS).*		X
Will the proposal be on land in Zone C1 National Parks and Nature Reserves or on a land use zone that is equivalent to that zone? *If so, consult with DPE (NPWS).*		X
Will the proposal include a fixed or floating structure in or over navigable waters? *If so, consult TfNSW.*		X
Will the proposal be on land in a mine subsidence district within the meaning of the *Coal Mine Subsidence Compensation Act 2017*? *If so, consult with Subsidence Advisory NSW.*		X
Will the proposal be on land in a Western City operational area specified in *the Western Parkland City Authority Act 2018,* Schedule 2 and have a capital investment value of $30 million or more? *If so, consult the Western Parkland City Authority*.		X
Will the proposal clear native vegetation on land that is not subject land (ie non-certified land)? *If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).*		X

Appendix D – Biodiversity Assessment Report

Appendix E – Orchid memorandum

Appendix F – Test of Significance

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