Royal HaskoningDHV
Enhancing Society Together

northern beaches council

REPORT

South Collaroy Foreshore and Stormwater Improvements – Review of Environmental Factors

Final

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1 Introduction

1.1 Overview

Royal HaskoningDHV (RHDHV) has been engaged by Northern Beaches Council (hereby known as Council) to undertake detailed design and Issued for Construction (IFC) level design for stormwater upgrades at the southern end of Collaroy beach, comprising the construction of a large box-culvert conduit outfall and associated junction pits. Ancillary to the overarching stormwater upgrade works includes the replacement of approximately 90 metres of the existing Collaroy seawall, proposed seaward of the stormwater infrastructure.

This report comprises the Review of Environmental Factors (REF) for Stage 1 (Option D) works only, as annotated in **Figure 1-1**. For the purpose of these activities, Council is the proponent and the determining authority under *Part 5* of the *Environmental Planning & Assessment Act, 1979 (EP&A Act)*.
This REF has been prepared following the guidance provided in the Department of Planning and Environment (DPE) Guidelines for Division 5.1 assessments (June 2022) and in accordance with the requirements under Divisions 5.5 and 5.7 of the EP&A Act to enable Council to examine any matters related to the works that could impact the environment, and whether any impacts are likely to significantly impact the environment such that the preparation of an EIS will be required.

This REF has been informed by a previous environmental assessment (EA) conducted by RHDHV covering the complete four-stage program of works proposed by Council, inclusive of Stage 1 stormwater upgrades from Alexander Street and Collaroy Street (RHDHV, 2021a).

1.2 REF Objective

This REF has been prepared to examine the likely environmental impacts from the associated Stage 1 Collaroy stormwater outlet and seawall upgrades detailed in Section 1.5, and provide measures to mitigate any adverse effects to the surrounding environment.

1.3 Document Structure

In summary, this REF document details the following sections:

- **Section 1:** The introduction, REF overview and project background
- **Section 2:** A review of the planning and legislative requirements
- **Section 3:** Stakeholder consultation
- **Section 4:** An assessment of the site conditions for each of the sensitive receptors, the potential environmental impacts, and identification of the proposed mitigation and control measures
- **Section 5**: Summary of future environmental management measures
- **Section 6**: Environmental factors considered under state and federal legislation
- **Section 7:** Conclusion
- **Section 9:** References

1.4 Project Background

1.4.1 Site Description

The Stage 1 works area is located at the southern end of Collaroy Beach, adjacent to the Collaroy Rock Pool. Stage 1 of the works extends from the eastern edge of the Collaroy Beach carpark to the western corner of the Collaroy rock pool. The area of works is annotated in Figure 1-1 below.

Figure 1-1 Site Overview

1.5 Proposed Works

1.5.1 Overview

A large Reinforced Concrete Box Culvert (RCBC) conduit and associated junction pits will be installed behind the proposed reconstructed seawall between chainage CH160 – CH280 (refer to **Figure 1-2** for chainage locations). Due to the size and construction constraints, most of this RCBC is proposed to be constructed using cast in-situ concrete methodology with temporary soil support and protection from inundation by the tide however the Contractor may elect to utilise precast methodology. In addition, diversion of upstream flows and groundwater from the excavation works will be required.

Approximately 90 m of existing seawall will be replaced from approximately CH 180 to CH 280, along with the existing stairs in front of the Collaroy rock pool amenities building. The seawall west of the new stairs will have sandstone blockwork facing walls similar to the existing wall (with existing blocks to be reused where possible), and the wall east of the stairs will have a coloured concrete wall. The concrete seawall and conduit east of the stairs will be constructed seaward of the existing seawall. The gap between the external wall of the culvert on the seaward side and the back of the stone blockwork will be filled with mass concrete. The stone blocks will be anchored into the mass concrete and/or culvert wall using stainless steel cogged dowels or ties. Refer to the Basis of Design report (RHDHV, 2021b) for further information.

Figure 1-2 presents the Stage 1 design overview developed as part of the 20% Detailed Design drawings (RHDHV, 2021c). A complete set of design drawings are provided in **Appendix A**.

1.5.2 Strategic Need for the Proposal

The proposed works align strategically with Council's program of repair of damaged assets and to address stormwater network capacity issues.

1.5.3 Overarching Objectives

The primary objectives for the proposed works will be to:

- Upgrade existing drainage conduits and pits at the southern end of Collaroy Beach, with the ultimate aim of improving ponding outcomes at Alexander Street, as well as assisting to facilitate a future diversion of flows away from the existing Collaroy Beach outfall (as discussed in the Concept Design Report [RHDHV, 2021d]);
- Improve the structural integrity of the seawall (part of which is currently failing between CH 200 to CH 230); and,
- Increase amenity by repairing damaged assets (i.e., the aforementioned existing partially failed seawall).

1.5.4 Staging of Works

An indicative and general work sequence is outlined below:

1. Install site fencing and establish site compound.
2. Install erosion and sedimentation control measures, in particular any coffer dam arrangements. (e.g. sand berm, or geo-bag wall) at the Collaroy seawall.
3. Install stormwater diversion measures.
4. Demolish existing infrastructure (e.g. the seawall, existing stormwater infrastructure and removal of temporary rock bags). Protect or remove street furniture offsite or store at site compound.
5. Install temporary access to the site.
6. Install temporary shoring for proposed seawall and stormwater construction.

7. Undertake seawall/ stairwell construction and install proposed stormwater box culverts, pipes and pits;
8. Reinstate all footpath and road pavement areas, and revegetate areas as required.
9. Remove erosion and sediment control measures, and undertake landscaping/ reinstatement (to be designed by others).

Figure 1-2 Preliminary Works Plan Detailed As Part of The 20% Detailed Design Drawings

1.5.5 Site Access, Office and Storage

Site access for the works compound will be via the entrance to the existing Collaroy Beach carpark off Birdwood Avenue. The works area will need to be fenced off during the works to protect the public and for security reasons. The site compound will be located within a small portion of the existing carpark, and will likely use the majority of the grassed reserve behind the seawall.

1.5.6 Construction Materials

The majority of the materials needed for construction would be delivered to site by truck. These materials may include:

- Erosion and sediment control;
- Geocontainer bags, rock bags or sand berm for temporary site protection during seawall and culvert demolition and construction;
- Concrete (culverts, junction pits, seawall, stairs, RCP pipes, stairwell and footings, footpath);
- Mass concrete;
- Cast iron pit covers;
- Stainless Steel Exclusion bars for outlet and Surcharge Slot;
- Formwork;
- Reinforcement;
- Engineering fill as required;
- Backfill material as required;
- Stainless steel handrails for seawall and stairwell;
- Sandstone blocks;
- Stainless steel cogged dowels or ties for anchoring sandstone into mass concrete;
- Road pavement material e.g. asphalt, base course gravels, sub-base;
- Topsoil and,
- Turfing.

1.5.7 Plant and Equipment

A range of plant and equipment would be utilised on the project, including but not limited to:

- Excavator(s) for earthworks;
- Plate Compactors and / or trench rollers
- Crane for lifting culvert sections (if Contractor elects to use precast methodology), sandstone wall construction and for placement / removal of temporary rock bags;
- Trench shoring or sheet piles with walers and struts;
- Variety of handheld power tools (concrete cut-off saw, diamond rock saw, jackhammer, drill etc.) for demolition and construction activities;
- Transit mixers for concrete supply; and,
- Trucks for delivery of materials such as sandstone blocks, reinforcement, formwork, engineered fill and other backfill materials, topsoil, turf, and for materials/ spoil haulage off-site.

1.5.8 Timing of Works

Stage 1 works are estimated to take up to approximately six to seven months to complete, depending on weather, tide and storm conditions. Daily work will be in accordance with the Interim Construction Noise Guideline (DECC, 2009) as detailed below in **Table 1-1**.

Table 1-1 Proposed Working Times

Working Days	Working Times
Monday - Friday	7:00 am – 6:00 pm
Saturday	8:00 am – 1:00 pm (To be confirmed by Council)
Sunday/Public Holidays	No work will occur on Sunday or public holidays

1.5.9 Alternative Options Overview

A number of alternative drainage upgrade options to Option D were also proposed and reviewed during the options assessment phase of the design. Further detail on these options can be found in Alexander Street, Collaroy Stormwater Investigation and Options Study (RHDHV, 2021d). A brief overview is provided below.

Eight (8) high-level concept design options were developed to address flooding concerns at Alexander Street, as documented in Royal HaskoningDHV (RHDHV, 2021f). The options were modelled hydraulically to assess their relative flooding benefit and high-level cost estimates were developed to assist Council with the determination of the preferred option. Based on the initial hydraulic assessment and cost estimates, 'Option D' was selected as the preferred option by Council to progress forward into detailed design. Option D proposes the removal of the existing Ø1800mm ocean outfall at Collaroy Street and ultimately discharging of flows into the rock pool ocean outlet. Option D includes an underbore crossing of Pittwater Road at Alexander Street. In addition, damage has been observed at the existing 600mm diameter pipe at the Collaroy Seawall, the seawall itself, and the rock pool outlet structure. As such, the majority of the high-level options assessed, including Option D, also addressed the requirement to replace approximately 80 metres of Collaroy seawall and the associated stormwater infrastructure in front of and behind the seawall.

Do Nothing

The do nothing approach will lead to further degradation of the stormwater infrastructure and seawall and will not address stormwater network capacity issues. Accordingly, the do nothing option would not achieve the project objectives.

2 Planning and Legislative Requirements

2.1 Overview

This section summarises the relevant legislative requirements to the proposed Stage 1 works. The requirements specified in this section have been informed by a review of relevant legislation, and advice provided by relevant government agencies. A summary of key outcomes is provided in **Table 2-1** below and further detail provided in **Section 2.2** to **Section 2.6**.

Table 2-1 Summary of key outcomes from an assessment of planning and legislation requirements for the proposed works.

Legislative Requirement	Summary of Key Outcomes	Relevant Section for further detail
Land Use and Ownership	• The proposed works area is controlled and managed by Council, zoned as RE1 (Public Recreation). • The section of seawall proposed across the intertidal zone (ref **Figure 2-1**), located within Lot 7351 DP 1166942 comprising Reserve 790606, is under the control and management of Council, not Crown Lands.	**Section 2.2**

Legislative Requirement	Summary of Key Outcomes	Relevant Section for further detail
	• No native title claims are noted within or nearby the proposed works area.	
Approvals Pathway	• Clause 2.137 of State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021 permits "Development for the purposes of stormwater management systems may be carried-out by or on behalf of a public authority without consent on any land." As the proposal is for construction works for the purpose of stormwater management and is to be carried out by Council, it can be assessed under Division 5.1 of the *EP&A Act*. Development consent is not required. A determining authority in its consideration of an activity shall examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.	**Section 2.3** and **Section 2.4**
Local Environmental Plan	• The proposed works meet the key objectives of RE1 zoning as per the Warringah LEP (WLEP). However, pursuant to Section 1.9(1) of the WLEP and as provided by Section 3.28 of the *EP&A Act*, the provisions of State Environmental Planning Policies prevail over the WLEP 2011 provisions.	**Section 2.4.2**
State Environmental Planning Policies (SEPPs)	*SEPP (Transport and infrastructure) 2021* • The proposed construction works are defined as upgrades to a stormwater management system and therefore can be carried out by Council without consent. • Prevails over other environmental planning instruments including the Warringah LEP (2011) with the exception of clauses 2.7, 2.8 and 2.16 of SEPP (Resilience and Hazards) 2021. *SEPP (Resilience and Hazards) 2021* • *Need for development consent* – The proposed seawall re-construction is ancillary to the overarching stormwater upgrades, and as such, the approvals pathway is determined by SEPP *(Transport and infrastructure) 2021* for the stormwater upgrades. Furthermore, in accordance with clause 2.16 (a) (iv), routine maintenance works or repairs to any existing coastal protection works may be carried out by a public authority without development consent and, the proposed works do not fall within wetland or littoral rainforest areas (under clauses 2.7 and 2.8, respectively), therefore, development consent for the works is not required under SEPP (Resilience and Hazards) 2021. As such SEPP (Transport and Infrastructure) 2021 prevails and development consent is not required. • *Adhering to coastal management areas and objectives* – Although development consent is not required under SEPP (Resilience and Hazards) 2021, the project site falls within the coastal zone. Proposed works either satisfy the objectives of the SEPP (coastal use area and coastal environment area) or in no way contradicts them, such that they do not significantly impact upon any element of the existing coastal system. Clauses 2.10, 2.11 and 2.12 are also satisfied.	**Section 2.4.3**

Legislative Requirement	Summary of Key Outcomes	Relevant Section for further detail
Other Relevant Guiding State Legislation Considered	• *Protection of the Environment Operations Act 1997 (POEO Act):* • *Fisheries Management Act 1994 (FM Act)* • *Crown Lands Management Act 2016* • *Biodiversity Conservation Act 2017* • *Water Management Act 2000* • *National Parks & Wildlife Act 1974* • *Native Title Act 1994* • *Heritage Act 1977*	**Section 2.4.4**
Commonwealth Legislation	• The proposed works would not have an impact on any matters of national environmental significance defined in the *EPBC Act 1979,* therefore, referral to the Federal Minister for approval is not required.	**Section 2.5**

2.2 Land Use and Ownership

The land use for proposed Stage 1 works is zoned as RE1 (Public Recreation) under the Warringah LEP 2011, as annotated in **Figure 2-1**. Surrounding land use includes low density residential (R2) and areas zoned for special activities (SP1). The SP1 zoned land is specialist accommodation for disabled persons suffering from permanent damage to their spinal cord.

Correspondence with Crown Lands on the 4 February 2022 confirmed that the section of seawall proposed across the intertidal zone (refer **Figure 2-1**), located within Lot 7351 DP 1166942 comprising Reserve 790606, is under the control and management of Council.

The Long Reef aquatic reserve partially overlaps the southern extent of the proposed study area adjacent to the rock pool, as depicted in **Figure 2-2**. **Section 2.4.4** provides an overview of the requirements for works proposed within or adjacent to an aquatic reserve, as stipulated by the Department of Primary Industries (regulating authority).

A search of the National Native Title Tribunal register of Native Title Claims did not indicate any active or determined native title claims at or near the site.

Figure 2-1 Land use zoning map for the study area (Warringah LEP 2011)

Figure 2-2 Map depicting the boundary of the Long Reef Aquatic Reserve (declared under the Marine Estate Management Act 2014)

2.3 Approvals Pathway

Clause 2.137 of State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021 permits "Development for the purposes of stormwater management systems may be carried-out by or on behalf of a public authority without consent on any land." As the proposal is for construction works for the purpose of stormwater management and is to be carried out by Council, it can be assessed under Division 5.1 of the *EP&A Act*. Development consent from Council is not required.

A more detailed discussion and justification of this pathway is provided in the following sections.

2.4 NSW Planning and Approvals Process

2.4.1 Overview

The New South Wales (NSW) environmental planning legislative framework provides for the classification of developments, and the assessment of impacts from developments and activities. This framework comprises:

- *Environmental Planning and Assessment Act (EP&A Act) 1979*;
- *Environmental Planning and Assessment Regulation (EP&A Regulation) 2021*;
- Environmental Planning Instruments (EPIs) made under the EP&A Act (i.e. State Environmental Planning Policies (SEPPs), Regional Environmental Plans (REPs), and Local Environmental Plans (LEPs)); and
- Other planning codes, policies, guidelines and strategies that relate to any proposed development of a particular site including Development Control Plans (DCPs) and Council codes and policies.

The statutory basis for planning and environmental assessment in NSW is set out in the *EP&A Act* and the *EP&A Regulations*. In NSW, before the approvals pathway (i.e. assessment under Part 4 or 5 of the EP&A Act) for a development can be defined it is necessary to answer two key questions:

- Whether development consent is required under a relevant local environmental planning instrument
- Whether the project is likely to have a significant impact on the environment.

Sections 5.5 and 5.7 of the EP&A Act and section 171(2) of the EP&A Regulations identify the factors required to be taken into account by a determining authority when assessing the environmental impact of a proposed activity. Clause 5.5 states that a determining authority must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity. Where it is concluded that the impact is unlikely to significantly affect the environment and hence an Environmental Impact Statement (EIS) is not required to be prepared under section 5.7 of the EP&A Act, the determining authority must take into account the environmental factors specified in section 171(2) of the EP& A Regulation. These factors are each addressed in **Section 4** and summarised in **Section 6.1**.

The definition of 'determining authority' includes: 'the Minister or public authority by or on whose behalf the activity is or is to be carried out…' 'Public authority' is defined in s 1.4 of the EP&A Act as '(a) a public or local authority constituted by or under an Act'. Councils are a public or local authority constituted by the *Local Government Act 1993* (see s 219) and are therefore a 'public authority' for the purposes of the EP&A Act. As the scope of works will be carried out by Council, and Council is a 'public authority' Council is a determining authority for the works.

Review of the EP& A Act indicates that the works may proceed in accordance with Part 5 of the EP&A Act, as development consent under Part 4 is not required due to the provisions of the SEPP *(Transport and infrastructure) 2021* (see **Section 2.4.3**).

Our assessment is that the scope of works, subject to the control measures set out in **Section 6** and **Section 7** are unlikely to cause a significant impact to the environment or threatened species, and therefore an EIS under Section 5.7 of the EP&A Act is not required.

2.4.2 Local Environmental Plans

The WLEP (2011) is the primary statutory plan for the site and is based on the requirements of the Standard Instrument (Local Environmental Plans) Order 2006. As noted in **Section 2.2**, the works fall on land zoned RE1 (Public Recreation). Land Zone RE1 has the following objectives:

- To enable land to be used for public open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.
- To protect and enhance the natural environment for recreational purposes.
- To protect, manage and restore public land that is of ecological, scientific, cultural, or aesthetic value.
- To prevent development that could destroy, damage, or otherwise have an adverse effect on those values.

However, clause 1.9(1) provides that the WLEP 2011 is subject to the provisions of any State environmental planning policy (SEPP) that prevails over the WLEP 2011 as provided by s 3.28 of the EP&A Act. Section 3.28 of the EP&A Act provides that in the event of an inconsistency between environmental planning instruments, there is a general presumption that a SEPP prevails over a LEP.

2.4.3 State Environmental Planning Policies (SEPPs)

2.4.3.1 SEPP (Transport and Infrastructure) 2021

SEPP (Transport and Infrastructure) 2021 updates and consolidates SEPP (Infrastructure) 2007, SEPP (Educational Establishments and Childcare Facilities) 2017, SEPP (Major Infrastructure Corridors) 2020, and SEPP (Three Ports) 2013. The proposed infrastructure upgrades for this project are addressed in Chapter 2, which aims to facilitate the effective delivery of infrastructure within NSW by public authorities. It does this by prescribing the infrastructure related works that may be undertaken without development consent, although the public authority may still be required to obtain an approval, licence or permit under another Act, such as the *FM Act.*

Clause 2.137 states that “Development for the purpose of stormwater management systems may be carried out by or on behalf of a public authority without consent on any land”. ‘Stormwater management systems’ are defined as any or a combination of the following:

- Works for the collection, detention, harvesting, distribution, or discharge of stormwater (such as channels, aqueducts, pipes, drainage works, embankments, detention basins and pumping stations).
- Stormwater quality control systems (such as waste entrapment facilities, artificial wetlands, sediment ponds and riparian management).
- Stormwater reuse schemes.

The works are therefore classified as a stormwater management system and as such SEPP (Transport and Infrastructure) 2021 prevails over other environmental planning instruments including the WLEP with the exception of clauses 2.7, 2.8 and 2.16 of SEPP (Resilience and Hazards) 2021, which are discussed below.

2.4.3.2 SEPP (Resilience and Hazards) 2021

SEPP (Resilience and Hazards) 2021 updates and consolidates SEPP (Coastal Management) 2018, SEPP 33 – Hazardous and Offensive Development, and SEPP 55 – Remediation of Land into one integrated policy. These policies are now repealed.

Coastal development is addressed in Chapter 2 of the SEPP (Resilience and Hazards) 2021 and gives effect to the objectives of the *Coastal Management Act 2016* from a land use planning perspective, by specifying how development proposals are to be assessed if they fall within the coastal zone.

Need for Development Consent

Under clause 2.7 and 2.8 of SEPP (Resilience and Hazards) 2021, development on land identified as coastal wetlands and littoral rainforests requires development consent. Additionally, under clause 2.16, certain coastal protection works require development consent.

The proposed works do not fall within wetland or littoral rainforest areas, therefore, development consent for the works is not required under SEPP (Resilience and Hazards) 2021. Furthermore, in accordance with clause 2.16 (a) (iv), routine maintenance works or repairs to any existing coastal protection works may be carried out by a public authority without development consent. Nevertheless, the proposed seawall re-construction is ancillary to the overarching stormwater upgrades. As such SEPP (Transport and Infrastructure) 2021 prevails and development consent is not required.

Coastal Management Areas and Objectives

Although development consent is not required under SEPP (Resilience and Hazards) 2021, the project site falls within the coastal zone. As such, a brief summary of the coastal management areas and key coastal management SEPP objectives met by the project is provided below.

The *Coastal Management Act 2016* defines the coastal zone as comprising four coastal management areas. SEPP (Resilience and Hazards) 2021 gives effect to the objectives of the Act from a land use planning perspective, by specifying how development proposals are to be assessed if they fall within the coastal zone. The four coastal management areas are:

- Coastal Wetlands and Littoral Rainforests Area – areas which display the characteristics of coastal wetlands or littoral rainforests that were previously protected by SEPP 14 and SEPP 26
- Coastal Vulnerability Area – areas subject to coastal hazards such as coastal erosion and tidal inundation
- Coastal Environment Area – areas that are characterised by natural coastal features such as beaches, rock platforms, coastal lakes and lagoons and undeveloped headlands. Marine and estuarine waters are also included
- Coastal Use Area – land adjacent to coastal waters, estuaries and coastal lakes and lagoons.

The project site is situated within a Coastal Environment Area and Coastal Use Area as shown in **Figure 2-3** below.

Figure 2-3 Coastal management designations for the study area

Development controls for a Coastal Environmental Area aim to protect the processes and values of coastal waters, estuaries, coastal lakes and lagoons and the natural features on the adjoining land, including beaches, dunes, foreshores, headlands and rock platforms. Controls identify the need to minimise impacts on the environment, and Council must be satisfied that the proposed development avoids, minimises or manages impacts on the following:

Clause 2.10 of the Resilience and Hazards SEPP - Development on land within the coastal environment area	Addressed in this REF
• The integrity and resilience of the biophysical, hydrological and ecological environment.	Potential biophysical, hydrological and ecological impacts have been addressed in **Sections 4.4** and **4.6**
• Coastal environmental values and natural coastal processes.	Potential coastal environmental values and natural coastal processes impacts have been addressed in **Section 4.7**
• The water quality of the marine estate, and has particular regard to cumulative impacts on sensitive coastal lakes.	Potential impacts to the water quality of the marine environment have been addressed in **Section 4.3**
• Marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms.	Potential impacts to marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms have been addressed in **Section 4.6**
• Existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including people with a disability.	Potential impacts to existing public open space and safe access to and along the foreshore have been addressed in **Sections 4.11** and **4.12**

• Aboriginal cultural heritage, practices and places.	Potential impacts to Aboriginal cultural heritage, practices and places have been addressed in **Sections 4.9** and **4.10**
• The use of the surf zone.	Potential impacts to use of the surf zone have been addressed in **Section 4.7**

The objectives of the Coastal Environment Area are identified in **Table 2-2**. The proposed works either meets these objectives or in no way is contrary to them.

Table 2-2 Objectives of Coastal Environment Areas

Objective No.	Objective Description	Works Compliance?
1	To protect and enhance the coastal environmental values and natural processes of coastal waters, estuaries, coastal lakes and coastal lagoons.	✓
2	Enhance natural character, scenic value, biological diversity and ecosystem integrity	✓
3	To reduce threats to, and improve the resilience of, coastal waters, estuaries, coastal lakes and coastal lagoons, including in response to climate change	✓
4	To maintain and improve water quality and estuary health	✓
5	To support the social and cultural values of coastal waters, estuaries, coastal lakes and coastal lagoons	✓
6	To maintain the presence of beaches, dunes and the natural features of foreshores, taking into account the beach system	✓
7	To maintain and, where practicable, improve public access, amenity and use of beaches, foreshores, headlands and rock platforms	✓

The Coastal Use Area is land adjacent to coastal waters, estuaries, coastal lakes and lagoons, where development is or may be carried out and impacts of development on the scenic and cultural values and use and enjoyment of the beaches, foreshores, dunes, headlands, rock platforms, estuaries, lakes and the ocean need to be considered.

The coastal use area represents some of the most environmentally, economically and socially valuable land in NSW. Development in this area must maintain and improve the scenic, social and cultural values of the coast for the enjoyment of current and future generations. Development proposals must address public interest and built form criteria to avoid, minimise or mitigate impacts on the following:

Clause 2.11 of the Resilience and Hazards SEPP - Development on land within the coastal use area	Addressed in this REF
• Existing, safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability.	Potential impacts to existing public open space and safe access to and along the foreshore have been addressed in **Sections 4.11** and **4.12**
• Overshadowing, wind funnelling and the loss of views from public places to foreshores.	Potential overshadowing, wind funnelling and the loss of views from public places to foreshores have been addressed in **Section 4.12**
• The visual amenity and scenic qualities of the coast, including coastal headlands.	Potential impacts to visual amenity and scenic qualities of the coast have been addressed in **Section 4.12**
• Aboriginal cultural heritage, practices and places.	Potential impacts to Aboriginal cultural heritage, practices and places have been addressed in **Sections 4.9**
• cultural and built environment heritage.	Potential impacts to cultural heritage have been addressed in **Section 4.10**

Development proposals must also consider the type, bulk, scale and size of the proposed development in the context of the surrounding area. The Coastal Use Area applies to land only. Development controls for coastal waters are in the Coastal Environment Area. Foreshore development which straddles land and coastal waters (i.e. this particular development) is assessed against development controls for both the coastal use and coastal environment areas.

The objectives of the Coastal Use Areas are identified in **Table 2-3**. The proposed works either meets these objectives or in no way is contrary to them.

Table 2-3 Objectives of Coastal Use Areas (Coastal Management SEPP)

Objective No.	Objective Description	Works Compliance?
1	The type, bulk, scale and size of development is appropriate for the location and natural scenic quality of the coast	✓
2	Adverse impacts on cultural and built environment heritage are avoided or mitigated.	✓
3	Urban design, including water sensitive urban design, is supported and incorporated into development activities	✓
4	Adequate public open space is provided, including for recreational activities and associated infrastructure	✓
5	The use of the surf zone is considered	✓

Clause 2.12 covering development in the coastal zone generally should also be considered. Development consent must not be granted to development on land within the coastal zone unless the consent authority is satisfied that the proposed development is not likely to cause increased risk of coastal hazards on that land or other land. Potential coastal hazard impacts have been addressed in **Section 4.7**.

It is recognised that the detailed design will meet the objectives of SEPP (Resilience and Hazards) 2021 so as to not impact upon any element of the existing coastal system.

2.4.4 Other Relevant State Legislation

Relevant additional State Legislation that would potentially apply to the proposed works includes the following:

- *Protection of the Environment Operations Act 1997 (POEO Act)* - Activities should be carried out in a manner which does not result in the pollution of waters.
- *Fisheries Management Act 1994 (FM Act)* - Permits under Part 7 of the Act are required for dredging and reclamation, temporarily or permanently obstructing fish passage, and harming marine vegetation.
  - A Fisheries permit under Part 7, Section 200 of the *FM Act* is required for dredging/reclamation due to disturbance of the seabed as part of the outfall demolition, seawall reconstruction and outfall works.
  - No temporary or permanent structures (such as a weir, causeway, dam, coffer dam etc.) or damage to marine vegetation will be undertaken negating the need for Section 219 or 205 permits.
- *Crown Lands Management Act 2016* – To undertake activities and work on Crown Land, a licence is required from the Department of Planning and Environment (DPE) – Lands (Crown Land). The stormwater works fall within the Crown Reserve with Council as the appointed Trustee and so a Crown Lands Licence would not be required. However, if any part of the outfall demolition works in the ocean falls outside the reserve, a Crown Lands Licence will be required.

- *Biodiversity Conservation Act 2017* -The potential impact of the proposal on threatened species has been assessed. This REF determined that there is not likely to be a significant effect on threatened species, populations and/or ecological communities listed in the NSW Fisheries Management Act or NSW Biodiversity Conservation Act, or their habitats from the proposed activities. Therefore, neither a species impact statement (SIS) nor a biodiversity development assessment report (BDAR), is required.
- *Water Management Act 2000* – Approval is required to undertake controlled activities on waterfront land (Section 91). However, the *Water Management Regulation 2011* outlines a number of exemptions for controlled activities. Where a public authority is carrying out the controlled activity on or in waterfront land, approval from the Office of Water is not required. As Council is to carry out the works, a controlled activity approval is not required.
  Some dewatering for the works associated with the trenched excavations may involve water extraction. To undertake construction dewatering, the following approvals may need to be obtained from WaterNSW under Section 89 and 90 of the *Water Management Act*:
  - Water supply work approval.
  - Water access licence (WAL) - unless the project qualifies for an exemption (activities taking 3ML or less)
  - Water use approval - unless there is a development application from a local government authority.

  Based on the fact that the proposed works would likely exceed 3ML of extraction, particularly during rainfall events, it is expected that an exemption for licencing would not be granted by Water NSW and a WAL would be required.
- *Marine Estate Management Act 2014 (MEM Act)* – Under clause 55 of the Marine Estate Management Act, a determining authority (not being a minister) (i.e. Council) must not carry out an activity within an aquatic reserve unless the determining authority has taken into consideration any management rules, the purpose of the reserve, permissible uses of the area under the management rules, objectives of the aquatic reserve, and any relevant reserve notifications. Furthermore, under clause 56 Council must not carry out an activity on land that is in the locality of an aquatic reserve, unless they have taken into consideration the purposes of the aquatic reserve, the regulations and any advice given to it by the relevant Ministers on the impact on the aquatic reserve.
  Based on requirements stipulated in the *MEM Act*, if Council is of the opinion that the proposed activity is likely to have an effect on the plants or animals within the aquatic reserve or their habitat (including soil, sand, shells or other natural materials) and/or any other matters identified above, they must consult with the relevant authority (DPI). Following consultation, a permit to harm animals or plants, damage, take or interfere with habitat, or conduct an activity that is prohibited under the Marine Estate Management Regulation 2017 may be required, as stated in the Aquatic Reserve Notification 2015 permit application (NSW DPI, 2022). This permit application can be jointly completed with the Fisheries permit under Part 7, Section 200 of the *FM Act*.
- *National Parks & Wildlife Act 1974* - Under s86, it is an offence to harm or desecrate an Aboriginal object or place. This REF determined there are no known sites or places of Aboriginal significance nearby to the work sites. In addition, the project is not located on land reserved under the National Parks and Wildlife Act 1974.
- *Native Title Act 1994* – No native title claims have been identified at or near the site.
- *Heritage Act 1977* - No heritage sites, areas or items identified within vicinity of the proposed works area.

2.5 Commonwealth Legislation

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) requires that proposals for development or “actions” that have, will have, or are likely to have, a significant impact on any matter of

national environmental significance are to be referred to the Commonwealth Environment Minister for consideration and approval.

The *EPBC Act* identifies the following matters of national environmental significance:

- World heritage;
- National heritage;
- Wetlands of international importance;
- Listed threatened species and communities;
- Listed migratory species;
- Protection of the environment from nuclear actions; and,
- Marine environment.

The proposed works would not have a significant impact on any of the above, therefore, referral to the Federal Minister for approval is not required.

2.6 Confirmation of Statutory Position

An assessment of the relevant statutory planning instruments has concluded that development consent is not required, and the proposal can be assessed under Part 5 of the EP&A Act by Council as the determining authority. The identified impacts in **Section 4** would not significantly affect the environment and therefore an EIS is not required and the environmental assessment for stormwater and seawall development activities takes the form of this REF. The proposal is also not likely to significantly affect threatened species or ecological communities, or their habitats so neither a SIS nor a BDAR is required.

3 Stakeholder and Community Consultation

3.1 Consultation Summary

Council in conjunction with RHDHV have undertaken consultation with NSW Department of Primary Industries (DPI) Fisheries, Crown Lands, Councils internal coastal team and several community stakeholders including the Collaroy Surf Life Saving Club. Communication pathways included meetings and emails.

Table 3-1 provides a summary of feedback provided by each stakeholder group with corresponding project specific responses.

Table 3-1 Summary of stakeholder feedback and corresponding project response to concerns raised

Stakeholder Feedback	Project Team Response
NSW DPI Fisheries	
Fisheries suggested artificial rock pools/hanging rock pools to be installed on the seawall. Fisheries has not had any reports of the artificial rock pools acting as a safety hazard.	RHDHV investigated the wave climate in the area to confirm whether the artificial rock pools would be applicable. This option was considered not appropriate for this area due to high wave forces in this location. Cast-in-situ options may be considered however do not form part of the current design.
Fisheries' preference is to install sandbags on the shore rather than sand berms as part of temporary works. Temporary works are not to interfere with vegetation on the rock platform. No pollutants from concrete pouring or other construction activities are to enter the water.	Site photos taken as part of the site inspection (RHDHV, 2021e) indicate that there is no marine vegetation inhabiting the rock platform where works are proposed. The Contractor shall implement a protection structure to protect the works from wave action, prevent against water seepage into the site and the escape of concrete or other pollutants from the site.
Fisheries raised concerns of water quality at the proposed stormwater outlet because of the nearby rock pool scupper.	Gross Pollutant Traps (GPTs) are being considered in later design stages for installation along the proposed stormwater line, which are designed to improve water quality. Additionally, the proposed outfall design further mitigates the potential for waves to wash stormwater discharge into the pool as the culvert outlet and the scupper will be located perpendicular to each other. RHDHV has also recommended physical water quality monitoring at the outfall and rock pool before construction and following outfall diversion to confirm whether water quality remains unaffected and to inform any future management decisions.
Council must submit an application under Part 7, Section 200 of the *FM Act* after making its own determination under Part 5 of the *EP&A Act.* This is due to proposed disturbance of the seabed as part of the outfall demolition, seawall reconstruction and outfall works. The REF and the determination are to be attached to the application to Fisheries.	Council to complete permit application following REF completion, including confirmation that the REF addresses key environmental concerns in accordance with Clause 171 of the EP&A Regulation 2021
NSW DPE Crown Lands	
The proposed works appear to be located within Lot 7351 DP 1166942	Noted, no licence is required from DPE.

Stakeholder Feedback	Project Team Response
comprising Reserve 790606. As Northern Beaches Council are responsible for the care, control and management of Reserve 79606 please contact Council directly any proposals affecting Reserve 79606.	
Internal Council Stakeholders	
The design to include bars or similar at culvert outlet to prevent children from getting into culvert.	Exclusion bars will be included at the outlet.
Maintain continued walking access from SLSC and carpark around playground to pool/headland during construction.	There will be a period (approximately 4-6 weeks) when access to the pool will not be available. Disabled access to the pool will not be available for approximately 8-12 weeks. Access to the pool will still be available from the walking track to the east off Beach Road however disabled access will not be available. Outside of this period, walking access to the pool will be available and will be managed by the Contractor, including disabled access. After approximately 12 weeks, disabled access to the pool may be provided via traffic control, if considered safe to do so by the Contractor. All timeframes will depend on the Contractor's methodology and consideration for pedestrian and vehicle safety.
Constructability review to look into staging of construction to provide the opportunity for disabled access to pool during/ or part of the construction period.	Refer above.
Grading of pavement to be per AS1428 with 1.2m wide landing.	The pavement above the culvert, particularly at the outlet, will be graded to meet the requirements of AS1428
Safety handrails are to be provided between the pool and the stairs, all 1000mm high	Handrails have been provided as requested.
Position of the stairs to be close to existing stairs and integrated with the junction pit (Pit 1A). Stairs are to extend to bedrock and be located parallel to the promenade.	Stairs will be designed as requested.
Pool scupper to be retained	Pool scupper position will be retained in the same general position, however will be moved slightly east to allow for the reconstruction of the suspended slab walkway. There will be no changes to the footpath levels above the outlet. Options for the outlet arrangement around the scupper have been considered and a final option has been documented.
Provide 250-300mm wide outstand over the outlet to hide the outlet.	Outstand will be provided as requested.
Existing Council services such as electrical cabling to be protected or relocated as part of the works.	Notes will be provided on the drawings and technical specifications.

Stakeholder Feedback	Project Team Response
Temporary electrical connections to be maintained to the amenities building.	
Internal Council Coastal Team	
Confident with the proposed design and works methodology as the seawall and stormwater upgrade retains a similar footprint to the existing infrastructure.	N/A
Targeted Community Groups	
The pool is used all year round from 40 swimmers in winter to 200 swimmers in summer and the community is worried about the closing of the pool and how to access the pool during construction for both abled and disables users.	Refer above.
Can temporary disabled access to pool be provided?	Refer above.
Construction is also to consider access to pool for pool cleaners and equipment.	For approximately 8 - 12 weeks there will be no vehicular access from the northern/western side of the pool as the culvert will be reconstructed in this location, and there will be limited vehicular access to the pool until the majority of the culvert works to the west of the amenities building have been constructed. Some pedestrian access may be possible after 4-6 weeks, depending on the Contractor's methodology and installation timeframe for the new pump cable. Alternatives if access is required, could involve lifting plant/equipment into the pool area from Beach Road or Council could investigate possible access from the beach on the southern/eastern side. All timeframes will depend on the Contractor's methodology and consideration for pedestrian and vehicle safety.
How to bring equipment to the pool for swim event (ropes, BBQ etc.)?	Council will look into provided temporary equipment storage at the toilet or in a container to be located next to the pool (to be confirmed). Site meeting with the community will be organised to confirm what is best. If a container is required this will have to be delivered before construction is starting.
Can a temporary pump be provided to avoid any shut down of pool?	It is likely the pool will be shut for 4-6 weeks while the temporary pool pump is relocated and during the construction of the downstream portion of the outlet. Temporary pumping arrangements should be considered by the Contractor. All timeframes will depend on the Contractor's methodology and consideration for pedestrian and vehicle safety.
How long can the temporary repair of seawall last (in the case the construction is delayed)?	The temporary rock bags were installed in mid-late 2020 and were designed for a 5-year life.
What is a realistic construction timeframe for the works?	The works are close to the tidal zone and potentially affected storm tides etc. Based on experience, the timeframe would be in the order of 6-7 months however this would be contingent on the prevailing weather conditions during construction.

Stakeholder Feedback	Project Team Response
Will there be any impact on the nearby playground (noise, dust, access)?	There may be some noise and dust impacts to the playground during construction. However, the Contractor will need to mitigate the impacts via a Construction Environmental Management Plan (CEMP) which should form part of their scope of works. Mitigation may include dust suppression and the use of low noise equipment, plus other methods that Contractors may identify. Access to the playground should not be affected by the works, however traffic control will be required for access to the playground on the eastern boundary of the site.
Will there be any impact on businesses?	Impacts to businesses are not expected.
What is the impact on parking?	Based on the development of the design to date and associated construction requirements, in the beach carpark, approximately 10 general, plus 2 disabled parking spots in the eastern corner of the carpark would be removed during construction. It is proposed to relocate the 2 disabled parking spots to adjacent parking locations in the carpark, meaning that 3 extra general parking locations would be impacted (to make provision for the accessible parking requirements – e.g. landing area for wheelchair). Two disabled parking spots on the entry road from Birdwood Ave to the carpark would be removed during construction and relocated to Birdwood Ave or the beach carpark during construction. This would result in the loss of approximately 2-3 parking spots along Birdwood Ave or an additional 3 parking spaces in the Collaroy Beach carpark. In summary, up to approximately 16 general parking spaces in the Collaroy Beach carpark will be impacted and up to 4 disabled parking spaces will be relocated to the carpark during the works. 2-3 parking spots on Birdwood Ave may be replaced with disabled parking. The number of affected parking spaces would be determined by the contractor and their methodology.
Will there be any impact on Emergency services access during construction	During construction of the downstream portion of the works, the pool will be closed and access to the pool from the shore will not be possible during this time. These arrangements should be communicated to the SLSC so that they can make alternative arrangements – e.g. rubber ducky boat. Once the first stage is completed, pedestrian emergency services access (e.g. surf life savers) may access the pool. Traffic control would be required for pedestrian access past the works site, and therefore access may be subject to a short wait if construction is in progress, subject to Contractor. While access is constrained, the SLSC should be advised of the need to make alternative arrangements. Emergency services vehicle access to the carpark from Pittwater Road will not be impacted. However, access from Birdwood Avenue may be impacted as it is proposed that the site compound uses the existing access from Birdwood Avenue. Given the construction traffic and site compound are proposed to be located off Birdwood Avenue, it would be preferable for all emergency services vehicles to access the car park via Pittwater Road for the duration of construction.

3.2 SEPP (Transport and Infrastructure) 2021 Assessment

Clauses 2.10 to 2.15 of SEPP (Transport and Infrastructure) 2021 contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. As Clauses 2.10 to 2.14 apply to consultation with councils (and emergency services) and Council is the proponent for this proposal, the consultation requirements of these clauses do not apply. As such, an assessment of Clause 2.15, relating to consultation with public authorities other than councils was conducted and is summarised in **Table 3-2** below. Findings from this assessment demonstrates that statutory consultation is not required in accordance with Clause 2.15.

Table 3-2 Assessment of SEPP (Transport and Infrastructure) consultation requirements

Item	Requirement
a) development adjacent to land reserved under the *National Parks and Wildlife Act 1974* or to land acquired under Part 11 of that Act—the Office of Environment and Heritage	The proposal is not adjacent to a National Park.
b) development on land in Zone E1 National Parks and Nature Reserves or in a land use zone that is equivalent to that zone—the Office of Environment and Heritage	The proposal is not on land in Zone E1 National Parks and Nature Reserves
c) development comprising a fixed or floating structure in or over navigable waters – Transport for NSW,	The proposal does not comprise a fixed or floating structure in or over navigable waters
d) development that may increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map—the Director of the Observatory	The proposal does not comprise development that may increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map
e) development on defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument—the Secretary of the Commonwealth Department of Defence	The proposal does not comprise development on defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument—the Secretary of the Commonwealth Department of Defence
f) development on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*—the Mine Subsidence Board	The proposal does not comprise development on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*

3.3 Ongoing and Future Consultation

Consultation with stakeholders and the community will continue throughout the detailed design and construction phases if and as required.

4 Environmental Assessment

This section considers the existing site conditions and the potential impacts for those environmental sensitivities considered relevant at the site in the context of construction activities proposed in **Section 1.5**. In addition to the detailed environmental assessment provided in **Section 4.2** to **Section 4.15**, mitigation and control measures are summarised for both construction and operational phases in **Table 5-1**.

4.1 Overview

The proposed site for construction activities comprises council owned and managed land along the existing southern seawall at Collaroy, adjoining foreshore and landward council reserve as depicted in **Figure 1-1**. Approximately 90 m of existing seawall is proposed for replacement from CH 180 to CH280, and concurrent stormwater upgrades behind the seawall from CH160 to CH280 as depicted in **Figure 1-2**.

The works would have discrete and localised environmental impacts, with potential effects on environmental aspects listed in **Table 4-1**.

Table 4-1 Summary of key environmental aspects assessed as part of this REF

Environmental Aspect Assessed	Reference
Soils and Geology	**Section 4.2**
Water Quality	**Section 4.3**
Hydrology and Hydrogeology	**Section 4.4**
Noise and Vibration	**Section 4.5**
Biodiversity	**Section 4.6**
Coastal Processes	**Section 4.7**
Air Quality	**Section 4.8**
Aboriginal Heritage	**Section 4.9**
Non-Aboriginal Heritage	**Section 4.10**
Traffic, Parking and Pedestrian Access	**Section 4.11**
Visual Amenity and Landscape Character	**Section 4.12**
Services and Utilities	**Section 4.13**
Waste Management	**Section 4.14**

4.2 Soils and Geology

4.2.1 Existing Conditions

Strata

Review of the eSPADE v2.1 (accessed via eSPADE v2.1 (nsw.gov.au)) geospatial mapping resource and MinView geological mapping (accessed via MinView | Regional NSW | Mining, Exploration and Geoscience) for Sydney indicates that the site is underlain by Quaternary (Holocene and Pleistocene) wind-blown, fine to medium grained, well sorted marine quartz sand, overlying interbedded shale, laminite and sandstone of the Triassic age Newport Formation.

A previous geotechnical study (JK Geotechnics, 2011) covering the existing stormwater pipe planned for removal as part of these works, located behind the existing seawall, indicated soils comprising fill, overlying natural marine sands, residual clays and interbedded sandstone and shale bedrock. Fill was observed to a maximum depth of 0.2 m below ground level (bgl), consisting of a silty sand topsoil layers and underlying gravelly sand. Underlying marine sands typically comprised beach sands and silty sands with large sandstone boulder inclusions, and residual clays were noted as medium to high plasticity of high strength.

JK Geotechnics also conducted a geotechnical investigation in 2019 for the beach access ramp adjacent to and north of the study area, which indicated a deeper soil profile without a notable fill layer and comprising marine sands overlayed by residual clays and weathered bedrock ranging from -10.3 mAHD to -12.3 mAHD.

Contamination

A search of the NSW EPA's Contaminated Land Record (accessed via https://apps.epa.nsw.gov.au/prclmapp/searchregister.aspx) did not present any contaminated sites in or nearby the study area. Narrabeen Shotgun Range was identified 4 km northwest of site and has an ongoing maintenance order placed on it, however, due to the distance from site the likelihood of impact to project works is considered low to negligible.

No specific contamination desktop or intrusive investigations were available for the study area, although fill observed during previous geotechnical investigations indicate no visual or olfactory contaminants present within the soil profile.

Acid Sulfate Soils

A search of the acid sulfate soils (ASS) probability map via eSPADE v2.1 indicates the works landward of the seawall fall within an area of low probability of occurrence in soils deeper than 3 m bgl. Additionally, the mapping suggests no known occurrence of ASS within the beach profile. Previous geotechnical investigations in the area (JK Geotechnics 2012, 2019) did not indicate the presence of ASS in bore logs. A 2011 JK Geotechnics geotechnical investigation indicated a high risk of ASS at two borehole locations, but these were located further landward well outside the footprint of the proposed works.

Figure 4-1 annotates the ASS probability mapping for the study area.

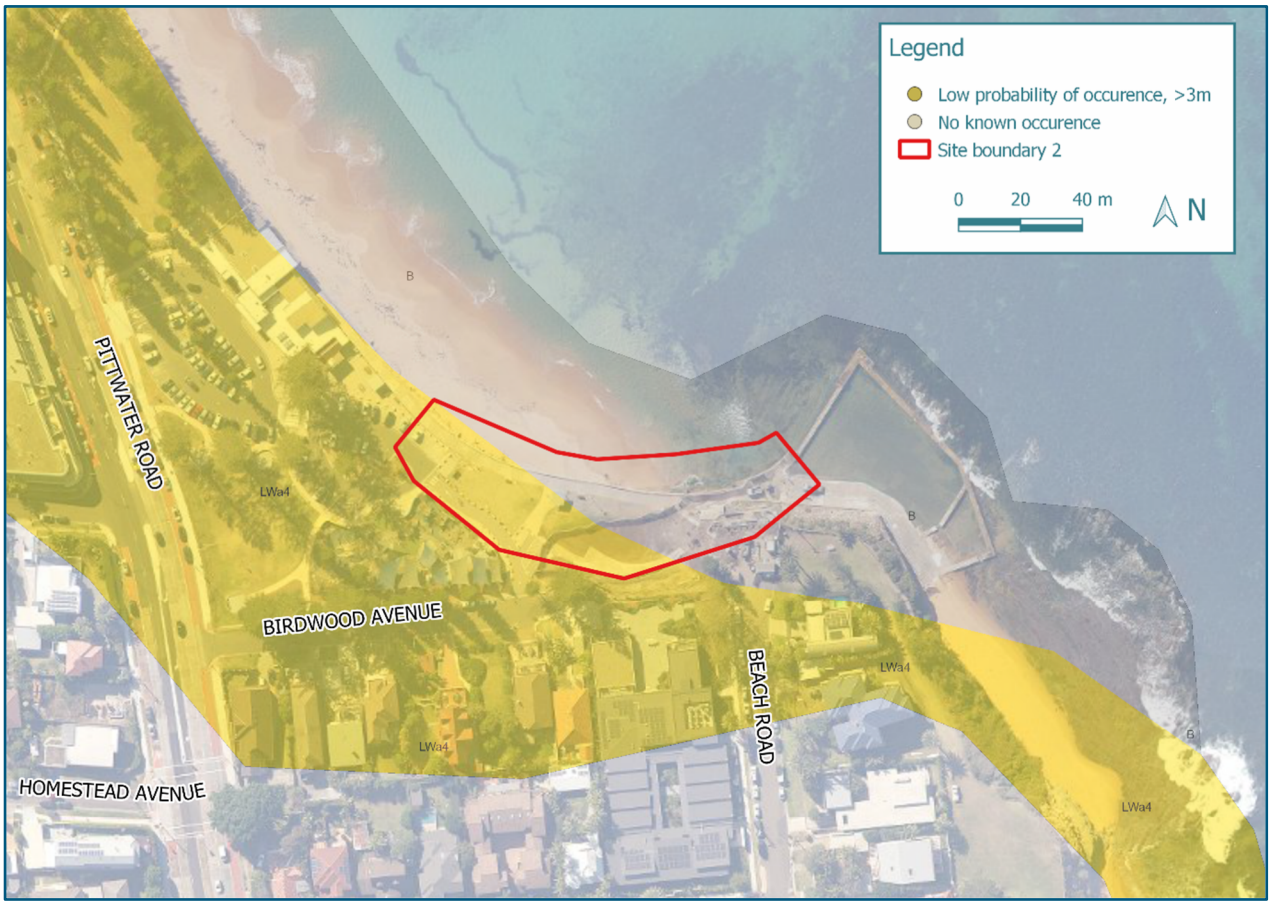


Figure 4-1 ASS probability mapping

4.2.2 Potential Impacts

The nature, scale and extent of potential impacts to soils and geology have been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment with the adoption of the proposed control measures.

The soils that will be disturbed during the works are expected to be predominantly uncontaminated natural material, in addition to a minor fill layer (topsoil), also likely to be uncontaminated. There is the potential for excavation to uncover unknown buried contaminated material, particularly contaminants discrete in nature.

The generation of waste to landfill is a potential impact following demolition of the existing seawall and excavation/ removal of the existing stormwater line, as well as construction of the proposed stormwater RCBC. Waste management is discussed in further detail in **Section 4.14**.

Potential ASS can pose a risk to marine environments if disturbed, specifically by activities such as excavation. However, given the low probability of ASS at depth, impacts associated with ASS are considered unlikely.

4.2.3 Recommended Control Measures

The following control measures are recommended:

- Soil and rock recovered during the works should be reused on-site where possible, in accordance with the Council's Waste Minimisation Guidelines (NBC, 2016).
- Any excess excavated beach sands should remain part of the active beach system.
- An Unexpected Finds Procedure (UFP) should be prepared and incorporated into the Construction Environmental Management Plan (CEMP) to facilitate effective management of contaminated material found during exaction works, including notifying the council for suggested action.
- If ASS is identified during excavation of subsurface materials, an Acid Sulfate Soil Management Plan (ASSMP) should be prepared to avoid environmental degradation if soils which are to be disturbed are found to contain actual or potential ASS.
- Temporary stockpiles should be protected with diversion drains, silt fences and straw bales to prevent soil loss.
- Tracking of soil from the construction site via construction equipment onto the roads should be minimised by cleaning of any machinery in a designated washdown area.

4.3 Water Quality

4.3.1 Existing Conditions

Historic stormwater quality reports were not available for the study area. In general, stormwater within an urban Sydney setting can carry a wide range of pollutants such as suspended solids, nutrients (nitrogen and phosphorus), heavy metals (copper, zinc and lead) and viral pathogens. The Collaroy Beach catchment consists mainly of residential land uses, with a concentration of commercial uses on Pittwater Road and Collaroy Street.

Two existing stormwater outfalls are located within the catchment, including the one proposed for demolition, positioned next to the replacement outlet (ref **Appendix A**), and the other situated approximately 200 m north along Collaroy Beach.

The stormwater outlet is proposed to terminate at and perpendicular to the existing Collaroy pool scupper to avoid the need for a shallow and wide box culvert beneath the existing scupper, and to minimise water quality impacts to the rock pool during periods of heavy rainfall and high-water levels. The location and positioning of the existing outlet, proposed outlet and pool scupper is provided in the 20% detailed design drawings in **Appendix A**.

4.3.2 Potential Impacts

The nature, scale and extent of potential impacts to water quality have been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment with the adoption of the proposed control measures.

Construction

During construction, the potential impacts to water quality may include:

- Sediment runoff and increased in localised turbidity within the nearshore zone/ rock pool from exposed soils during excavation and stockpiling.
- Increased localised turbidity impacts from groundwater inflow and surface water pooling in excavations.

- Contamination of the ocean from plant and machinery leaks and spills during operation and maintenance. Likely harmful contaminants to potentially enter the adjacent waters during construction activities include fuel, coolant, lubricants, and hydraulic fluids.
- Waste materials from the seawall demolition and construction entering the ocean. The temporary geocontainer/sandbag (or similar) wall is expected to provide adequate bunding of demolition waste during the construction phase of works.
- Gross general waste from construction workers entering the waterway, typically comprising small items such as bottles, cans, soft plastic packaging etc.

Operational
No wider changes to water quality are proposed as part of the drainage upgrade works. However, as a larger portion of the Collaroy beach catchment may in the future be diverted to a single outlet location (the rock pool outlet), the resultant water quality impacts during rainfall events will likely be greater in this area.

Stormwater discharge via the proposed outlet during high rainfall events and high-water levels (i.e. high tides and increased wave action) has the potential for recirculation into the rock pool. The invert of the scupper – RL 0.77 m AHD is a level just lower than the Highest Astronomical Tide level (approximately RL 1.1m, AHD) and from a review of statistical tidal levels (ref. **Section 4.7.1**), it was found that the scupper would only be inundated (by a standing water level) up to 16 days per year. Furthermore, this tidal level would need to occur in combination with actual stormwater discharge and significant wave action to force water back up the scupper and into the pool, indicating the impact would be infrequent and minimised as best as possible through the proposed design. Refer to Section 5.4.3.1 of the Basis of Design report (RHDHV, 2021b) for further information.

4.3.3 Recommended Control Measures

Implementation of the following controls would ensure that the proposed works will not have significant adverse impacts on water quality at the area of works and at Collaroy Beach.

Construction
Construction phase erosion and sediment control measures are to be installed and maintained by the contractor in accordance with Council's requirements and the guideline *Managing Urban Stormwater, Soils and Construction* (known as the 'Blue Book') (Landcom, 2004).

An Erosion and Sediment Control Plan (ESCP) should be prepared as part of the detailed design stage and integrated into the CEMP. The ESCP is to incorporate measures to prevent the discharge of soil and waterborne pollutants beyond the extent of work during and immediately following construction.

Prior to construction, Council may consider undertaking water quality monitoring of the outlet and pool to provide a baseline for future water quality monitoring.

The following control measures should be implemented as a minimum:

- Stabilised site access at all entry and exit points to the extent of work.
- Further sediment controls installed at the seawall to prevent erosion/sedimentation in these areas.
- Implementation of filters / sediment traps at all drainage inlets.
- Installation of sediment fencing along the extent of works.
- Appropriate management of any stockpiled materials such as covering or watering.
- Stockpiles should be located on flat ground at least 5 metres away from areas subject to run-off and away from established flow paths (e.g. drains, gutters, etc.). The height of the stockpiles should not exceed 2 metres unless stockpiles are suitably protected from wind erosion.

- Additional sediment controls (e.g. curtains, hay bales etc.) held onsite for the duration of the works and used for any unforeseen sedimentation issues.
- Rehabilitation and revegetation of disturbed areas as soon as practical to promote sand and sediment stabilisation.
- A water treatment tank or baffle tank used to settle out solids within groundwater captured in excavation pits prior to discharge into stormwater. Water quality around the seawall must be monitored to determine whether treatment of groundwater is required.
- Implementation of an effective spill and leakage procedure with the following control measures implemented as a minimum:
    - The use of sand berm, sand-filled geocontainer wall or rock bags to protect against seepage and the escape of concrete or other pollutants from the site.
    - Emergency spill kits kept on-site at all times and maintained throughout the construction work. The spill kit must be appropriately sized for the volume of substances at the work site. A spill kit would be kept on heavy plant and in the temporary construction compound site.
    - Small carrying plant or machinery fitted with bunding around equipment to prevent accidental spills or leaks from entering the water.
    - If a spill occurs, the Council contract manager and environment staff should be notified as soon as practicable.
    - All staff made aware of the location of spill kits and trained in their use.
    - The contractor should ensure that all plant is maintained in good working order with regular servicing.
    - No major maintenance of equipment undertaken on-site.
    - Daily inspections of plant, minimisation of fluids on site, and proper procedures for refuelling and maintenance need to be observed.
- Waste bins available for use onsite and disposed of at a license facility frequently.

Operational

Potential increases in water quality impacts at the stormwater outlet and adjacent rock pool have been partially addressed by the following control measures:

- Installation of a large Gross Pollutant Trap(s) (GPTs) is proposed to address the gross water quality impacts associated with diverting stormwater to the rock pool outlet, and as such any changes to gross water quality conditions will be mitigated. A feasibility study has been undertaken by RHDHV to GPT requirements including sizing and optimal locations. Installation of GPTs would be undertaken as part of future works stages.
- The proposed design further mitigates the potential for waves to wash stormwater discharge into the pool as the culvert outlet and the scupper will be located perpendicular to each other, and it is expected that separation of flow will occur from the top of the conduit as it nears the outlet which will reduce the potential for stormwater entering the scupper.

Based on these design-centred control measures, water quality impacts are expected to not be significantly in excess of current conditions during stormwater discharge events, and may actually improve as a result of the implementation of the planned GPT. However, due to the expected increases in discharge at the new outlet following plans to divert a larger portion of the catchment to this point, water quality monitoring at the outfall and rock pool is recommended before construction and following outfall diversion to confirm whether water quality conditions remain unaffected and inform future management decisions.

4.4 Hydrology and Hydrogeology

4.4.1 Existing Conditions

The existing stormwater network proposed for upgrade is presented in **Figure 4-2** below.

Figure 4-2 Existing stormwater network for the study area (Source: RHDHV 2021f)

Two existing stormwater ocean outfalls are located within the catchment, including the one proposed for demolition, positioned next to the replacement outfall (ref **Appendix A**) and the other situated approximately 200 m north along Collaroy Beach.

A review of the NSW Hydrography web service (accessed via NSW Hydrography | Data.NSW) indicates the closest major water courses to site include the South Pacific Ocean immediately east, Narrabeen Lagoon 1.6 km northwest and Dee Why Lagoon 1.3 km south. Two minor unnamed water bodies are located approximately 200 m west of the site in notable vegetated areas. Aerial imagery of these water bodies suggests they do not directly contribute to surface water flows within the study area, however, they likely contribute to stormwater upstream of site.

The geotechnical investigation conducted in 2011 by JK Geotechnics indicated tidal groundwater seepage was encountered whilst auger drilling in the beach reserve landward of the proposed seawall. Groundwater intrusion occurred between approximately 1-3 m below ground level within the sandy soil profile and bedrock profile. Recorded standing water levels across these drilling locations ranged between approximately RL 0.5 m and RL1.0 m.

In the relevant test pits, groundwater was not encountered during excavation or shortly following completion. These test pits were shallow in nature (< 1 m below ground level) and beach sands at the base of one test pit central to the proposed seawall works (about RL 0.5m) were noted as ‘wet’ which suggest that the tidal water surface would have been a short depth below the test pit base.

In reality, groundwater levels will be greatly dependent on antecedent rainfall conditions, and so groundwater control measures may or may not be required depending on the amount of rainfall that occurs prior to and during the works period.

4.4.2 Potential Impacts

The nature, scale and extent of potential impacts to hydrology and hydrogeology have been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment with the adoption of the proposed control measures.

The overarching purpose of the stormwater upgrade works is to mitigate impacts associated with the depth and duration of floodwater ponding at the Alexander Street sag point. In addition, provision has been made in the design to address floodwater ponding at the sag point on Pittwater Road. As such, the works will have a positive effect on the hydrology of the area. Refer the RHDHV Concept Design Report (RHDHV, 2021f) for detailed discussion of hydrological results.

A review of the draft Geotechnical Investigation conducted by Douglas Partners (2021) indicated shallow groundwater will need to be taken into account for all excavations, and de-watering is likely to be required, e.g. through “spear points” around the excavation. Additionally, due to the expected connectivity with the groundwater, the potential for leaks and spills poses a risk to water quality via groundwater pathways.

Dewatering may result in settlement of adjacent structures and will need to be monitored by the Contractor.

4.4.3 Recommended Control Measures

Shallow groundwater will need to be taken into account for all excavations, de-watering is likely to be required, e.g. through “spear points” (groundwater extraction devices) around the excavation footprint.

To mitigate the potential water quality impacts from groundwater inflows, a water treatment tank or baffle tank would likely be required to settle out solids (mostly fine sand) prior to discharge to stormwater, or (if contaminated with other substances) to sewer through a Trade Waste Agreement (TWA) with Sydney Water Corporation. Albeit, groundwater is most likely not contaminated, as clean soils including marine sands were encountered during previous intrusive investigations. Additionally, procedures for control of leaks and spills on site should be undertaken in accordance with those outlined for water quality in **Section 4.3.3**.

All dewatering measures would need to be undertaken in line with any water use licences which may be required by Water NSW.

4.5 Noise and Vibration

4.5.1 Existing Conditions

Noise

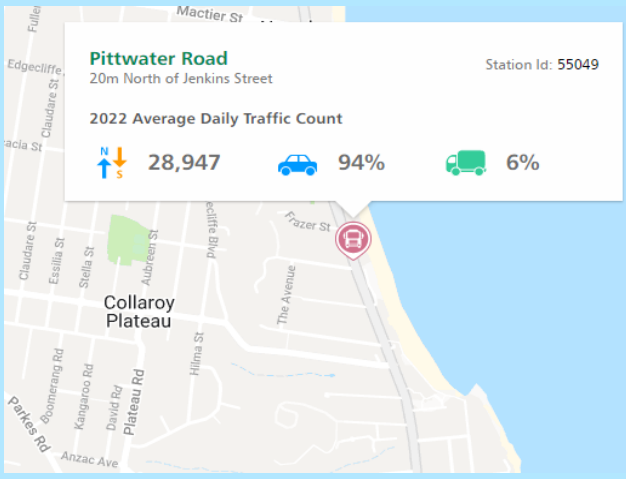
The acoustic environment surrounding the site is influenced by road traffic, recreational users, and ocean waves. The closest sensitive receivers to construction noise and vibration relevant to the proposed works sites are recreational beach/ rock pool/ park users, pedestrians, ecological communities, residences and commercial businesses along Pittwater Road, Birdwood Avenue and Beach Road.

Overall, given that the site has a strong coastal recreational basis (i.e. beach and foreshore users) and is within 100 metres of Pittwater Road, the background noise levels are considered to be moderate, particularly during the summer period.

Background noise levels have been estimated using the Transport for NSW (TfNSW) Construction and Maintenance Noise Estimator tool (TfNSW, 2022). Although these works are not specific to road construction, the tool provides relevant estimations of background noise in varying land use scenarios and distances sensitive receivers will be impacted by varying relatable construction noise.

To aid in the classification of background noise levels, a review of the average daily traffic count (ADTC) along Pittwater Road was obtained via TfNSW traffic volume viewer (accessed via Traffic Volume Viewer (nsw.gov.au)) and used in combination with the urban setting to determine a 'noise area category' for the site. **Table 4-2** provides an overview of the background noise levels calculated for the project area and ADTC for Pittwater Road.

Table 4-2 Summary of estimated background noise at site (Using TfNSW Construction Noise Calculator) and ADTC along Pittwater Road

Noise category		R2	
L_{A90} Background Level (dB(A)	Day	45	
	Evening	40	
	Night	35	

Vibration

The primary source of ambient vibration nearby the study area is Pittwater Road, which would not carry into the study area.

4.5.2 Potential Impacts

The nature, scale and extent of potential impacts from noise have been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment with the adoption of the proposed control measures.

As construction works are proposed in the vicinity of residential, healthcare (Spinal Cord Injury (SCI) Accommodation) and recreational space including a playground, the potential for noise and vibration impacts to sensitive receivers is likely, albeit short-term over the construction lifespan. There would be no significant increases in noise levels and subsequent impact to sensitive receivers during the operational phase the project.

Likely noise and vibration generating works during construction include excavation in soil and bedrock, seawall demolition, heavy plant and vehicle movements, and concreting.

Noise

Typical construction generated noise impacts to human health include but are not limited to sleep disturbance, stress, and to a lesser extent, hearing loss.

A distance-based assessment was conducted for the proposed works using the TfNSW Maintenance and Construction Noise Estimator tool. Inputs included the noisiest plant proposed for use, background noise levels (calculated above) and whether or not there is direct line of sight between the receivers and construction works. **Table 4-3** below summarises the distances residential receivers will be affected by the loudest construction activity planned.

Table 4-3 Summary of distance-based assessment of noisiest plant using the TfNSW construction noise calculator

Residential Land Use Scenario	Noisiest Plant	Line of Sight	Time of Day	Affected distance (m)
Developed settlements (urban and suburban)	Concrete or Rock Saw**	No (Buildings and topography)	Day	140
			Day (OOWH)	200
			Evening	290
			Night	420
			Highly Affected	25

*OOHW – Out of Hours Work
** Data for rock saw is not available

Results of the distance-based assessment are annotated in **Figure 4-3**, indicating residential receivers along Birdwood Avenue, Brissenden Avenue and the eastern extent of Eastbank Avenue and Beach Road, including the spinal care accommodation, will be affected by the peak construction noise during works scheduled at any time. Receivers will only be 'highly affected' by peak construction noise when passing by works within 25 m of the activity. It is expected that peak construction noise (i.e. concrete cutting and demolition) will be infrequent with regular respite periods and moderate-term (~ 6 months), therefore, the impact to sensitive receivers is considered low with the appropriate mitigation measures implemented (ref **Section 4.5.3**).

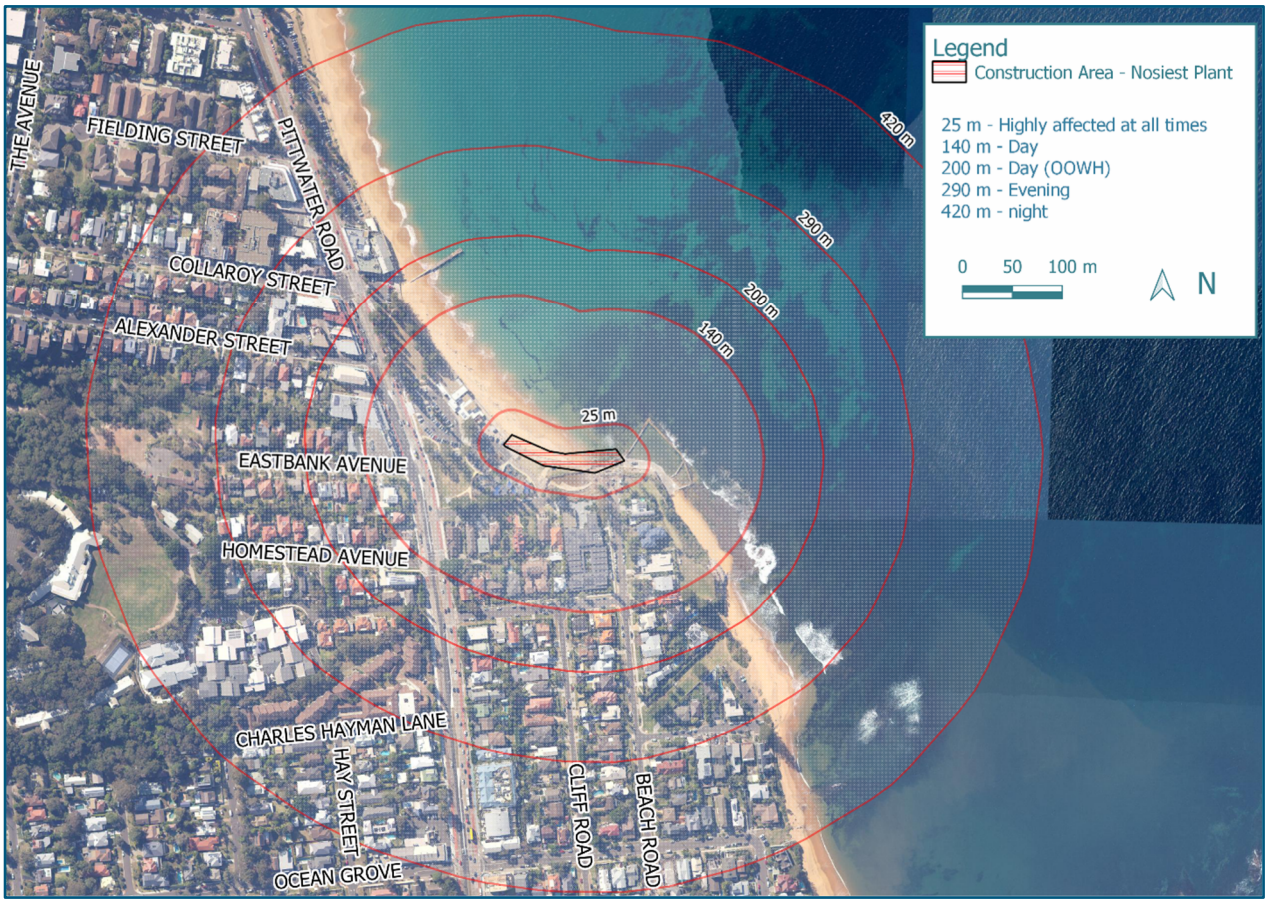


Figure 4-3 Distance-based assessment of residential receivers effected by peak construction activity onsite, as obtained from the TfNSW Maintenance and Construction Noise Estimator tool (TfNSW, 2022).

Noise impacts from construction have the potential to have short term behavioural impacts on marine fauna, especially vertebrates including fish, marine birds and marine mammals. It is unlikely that such impacts would be significant for marine birds considering the local ambient noises in the surrounding area, predominantly traffic from Pittwater Road. Similarly, impacts to marine fauna below Mean Sea Level is considered minor due to the intermittent and temporary nature of proposed activities. Overall, any potential noise impacts from the project on marine fauna are considered to be temporary, localised and relatively minor in nature.

Vibration

Excessive vibration during construction activities carries the potential of impacting both human and ecological health, as well as facilitate damage to infrastructure including underground services. Impacts to humans occurs in the form of prolonged discomfort, sleep disruption and stress among other affects, whilst ecological impacts can include animal behavioural patterns and communication.

A review of safe working distances for the proposed items of vibration intensive plant provided in the TfNSW Construction Noise and Vibration Guideline (TfNSW, 2023) relevant to proposed works as summarised in **Table 4-4**.

Table 4-4 Recommended safe working distances for vibration intensive plant

Plant Item	Rating / Description	Safe Working Distance	
		Cosmetic Damage (BS 7385)	Human Response (NSW EPA Vibration Guidelines)
Medium hydraulic hammer	900kg - 5 to 12t excavator	7 m	23 m
Vibratory Pile Driver	Sheet Piles	2 m to 20 m	20 m
Jackhammer	Handheld	1 m (nominal)	2 m
Rock saw	Handheld	No guideline	No guideline

Based on a review of safe distances presented in **Table 4-4** and distances of residential receivers, expected construction vibration levels are not expected to impact sensitive vibration receptors. Impacts to pedestrians, beach goers and pool users are expected to be short-term and minor, as safe working distances relate to continuous vibration, not discrete exposure. Similarly, due to the short-term and intermittent nature of vibration works, activities should not pose any detrimental effects on potentially exposed marine fauna. Implementation of the recommended control measures described in **Section 4.5.3** should further alleviate any impacts from vibration heavy activities.

Construction works, particularly the demolition of the seawall at the southern end of the construction boundary has minor potential to impact the structural integrity of the adjoining seawall, rock pool wall, nearby public amenities building and underground services including sewer. However, implementation of the appropriate mitigation measures as described in **Section 4.5.3** should facilitate effective management of such vibration impacts prior to works commencing.

4.5.3 Recommended Control Measures

In order to prevent or minimise any potential for noise and vibration impacts on beach users, the surrounding community and the environment, the following control measures should be taken:

- Works should be undertaken during the standard construction hours where practicable (i.e. 7.00 am to 5.00 pm Monday to Friday and 8.00 am to 1.00 pm Saturdays, with no work to be undertaken on Sundays and Public Holidays), in accordance with the NSW Interim Construction Noise Guideline (ICNG) (DECC, 2009). On occasion works may be required outside of the standard hours to take advantage of available daylight hours and suitable tide conditions. Where works are required outside of the standard hours, notification will need to be provided to local residents by Council.
- Noise management levels (NMLs) should be maintained in accordance with NSW ICNG (2009) guidelines of RBL + 10dB for noise affected areas in standard working hours, RBL + 5 dB for noise affected areas outside of recommended working hours, and a maximum of 75 dB(A) for highly affected area (i.e. within 25 m of the works area).
- Construction personnel would be informed of the location of sensitive receivers, and the need to minimize noise and vibration from the work, through the site induction and regular toolbox talks.
- Beach users and surrounding residences and businesses should be notified of the proposed works and hours of operation.
- A Council contact should be provided for the works in the event of any complaints.
- Instructions should be issued to the Contractor that appropriate silencers are to be fitted on all plant and equipment.
- Works should be undertaken in the non-peak visitor and recreation periods if possible (i.e. during winter months.

- Plant should be turned off when not in use (i.e. not left idling).
- Noisy plant and equipment should be oriented away from sensitive receivers where possible.
- The use of horns and alarms should be minimised to the extent possible while satisfying legislative requirements.
- High vibration methods should be substituted with lower vibration methods where possible, particularly in relation to demolition, sheet piling and ground excavation/ compaction works.
- If vibration impacts on nearby structures (i.e. the public amenities block and rock pool wall) are deemed a concern, the physical integrity of each structure should be inspected by a structural engineer and/ or a dilapidation survey conducted to identify/ assess potential structural impacts prior to works commencing.

4.6 Biodiversity

4.6.1 Existing Conditions

Flora and Fauna

Intertidal sandy beach and intertidal boulder habitat is located adjacent to the proposed replacement seawall works and rockpool outlet. The Long Reef aquatic reserve partially overlaps the southern extent of the proposed study area adjacent to the rock pool, as depicted in **Figure 4-4**. Biodiversity of flora and fauna is considered to be quite low in this area, likely due to the dynamic nature of sand transitioning on and off the nearshore reef during varying seasonal ocean conditions. Only filamentous green algae, sea lettuce and a few sessile organisms (oysters, limpets, chitons, periwinkles, and tube worms) have been observed (Cardno, 2011); organisms that are typical of intertidal zones in coastal NSW. No sensitive marine habitats such as seagrasses or macroalgae dominated subtidal reefs are present.

Threatened Species and Communities

No declared Critical Habitat (listed under the FM Act 1994 or EPBC Act 1999) or Areas of Outstanding Biodiversity Value (listed under the BC Act 2016) occur within the extent of the Works.

Records of threatened species, populations and endangered ecological communities have been obtained from a desktop review of databases, sightings data and known habitat descriptions and distributions for the locality. The following databases were searched:

- NSW Department of Primary Industry and Environment (DPE) **BioNet Atlas (10 km radius)** (Accessed via https://www.environment.nsw.gov.au/atlaspublicapp/)
- Australian Government Department of Agriculture, Water and the Environmental (DAWE) **Protected Matters Search Tool (1 km radius)** (Accessed via https://pmst.awe.gov.au/)
- NSW Department of Primary Industry (DPI) **Threatened Species lists** (Accessed via https://www.dpi.nsw.gov.au/fishing/threatened-species/what-current)

A search of the BioNet Atlas was undertaken, centred on the site and comprising the minimum 10km x 10km. The search resulted in 84 listed threatened species records, comprising 17 species of flora and 67 faunal species. A variety of terrestrial and marine-based species were identified. One endangered population (Koala) has been recorded within the 10km search radius, however, this population has not been observed nearby or within the study area and as such are not expected to be impacted by the proposed works. No endangered ecological communities were noted within the search radius.
The nature of the project and extent of coastal urbanisation onsite makes many of the records irrelevant in terms of potential impact. For this reason, a closer examination of the records provided for the project site and surrounds was completed as annotated in **Figure 4-4**. Only three species of animal have been

observed in proximity to the site, including a Noisy Miner, Common Ringtail Possum and Sulphur-crested Cockatoo, all of which are not listed as threatened.

Figure 4-4 Location of species not listed as Threatened recorded on the BioNet Atlas in close proximity to the project site

The search of the Commonwealth *EPBC Act* matters of national environmental significance (MNES) via the protected matter search tool determined that 81 listed threatened species, 64 migratory threatened species and 6 listed threatened ecological community are either known, likely or have potential to occur within a 1 km radius of the site. Of this large list, only a small number have the potential to be onsite, namely migratory bird species and foraging marine species during high tide, none of which inhabit the site area. As such, the likelihood of significant impact to these species during works is considered low to negligible.

Although there are threatened species and communities identified in the locality of the works, the site of the works and the extent of the wider environment reasonably affected by the works do not include the habitats of any such communities or species.

No other MNES such as Wetlands of International Importance or Commonwealth Marine Areas were identified as potentially occurring in or nearby the study area.

4.6.2 Potential Impacts

The nature, scale and extent of potential impacts to biodiversity have been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment with the adoption of the proposed control measures.

As discussed in **Section 4.6.1** above, impacts to threatened species and ecological community's common to the Sydney coastline and of known occurrence on and nearby site are considered unlikely during the proposed works. In addition, the works will not impact on habitat of protected fauna (within the meaning of the National Parks and Wildlife Act 1974) nor will the works result in the endangering of any species of animal, plant or other form of life whether living on land, in water or in the air. Regardless, the following potential ecological impacts have been considered:

- Changes to habitat structure that is potentially occupied by filamentous green algae, sea lettuce and sessile organisms within the nearshore zone where the new seawall and stormwater outlet is proposed.
- Potential release of toxicants from excavated soils. Previous geotechnical studies indicated no contaminating sources were present within subsurface material.
- Potential release of toxicants (i.e. concrete, fuel, coolant, lubricants, and hydraulic fluids) from plant leaks and spills and other construction activities.
- Noise and vibration disturbance from demolition of existing seawall and construction.
- Interference with native faunal species such as migratory birds during works.
- Revegetation of site with non-native and weed species.

It is expected that the potential impacts to flora and fauna would be highly localised, minor and short term and would not threaten the livelihood of individuals or populations. The proposed works are unlikely to have any significant impact on any species of threatened or protected flora or fauna that have the potential to occur at the study site if appropriate mitigation measures are adopted.

4.6.3 Recommended Control Measures

Based on the searches conducted and assessed above, the stormwater and seawall construction activities are considered unlikely to have a significant impact on State and/or Commonwealth listed threatened biodiversity. As such, referral to the Department of the Environment under the *EPBC Act* is not required. Similarly, the preparation of a Species Impact Statement (SIS) based on the provisions of the *BC* and *FM Act* is not required. Based on the NSW Policy and guidelines for fish habitat conservation and management, a Section 205 - permit to harm (cut, remove, damage, destroy, shade etc.) marine vegetation (saltmarshes, mangroves, seagrass and seaweeds) is not required.

In response to the potential ecological impacts described in **Section 4.6.2**, the following control measures are recommended:

- Incorporation of a habitat conscious seawall design for intertidal species, such as through the provision of artificial rock pool attachment (recommended by NSW DPI Fisheries during consultation) to the seawall, would not be able to survive the marine wave climate. Stencilled concrete was originally proposed on the concrete seawall to provide algae and other intertidal species a textured surface for attachment, however has been removed from the design as requested by Council.
- Implementation of an effective spill and leakage procedure with control measures listed in **Section 4.3.3** (Water Quality).
- Minimisation of loud and abrasive works below the MHWM where possible.
- Contractor should cease work activities and notify Council if fauna species are observed to persistently occupy areas in the immediate vicinity of work zones.
- If native fauna is injured, immediate contact should be made with a wildlife rescue service or a veterinary surgeon.

- When revegetating sites, the following plants shall not be used and shall be controlled in according to a weed management plan for the sites:
    - Plant species listed as weeds by NSW Department of Primary Industries (http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles)
    - Plant species listed as part of key threatening processes (http://www.environment.nsw.gov.au/threatenedspecies/KeyThreateningProcessesByDoctype.html)

4.7 Coastal Processes

4.7.1 Existing Conditions

Narrabeen-Collaroy beach is an east facing embayment of around 3.6km length. The location of the stormwater outlet at Collaroy is at the very southern extent of the beach. The Long Reef headland and more locally the Collaroy Rockpool provides significant shelter from the dominant south to southeast deepwater swell conditions. These average conditions are interspersed with “East Coast Low” events (Speer et al., 2009). These occur 4 to 5 times per year and bring significant wave heights exceeding 8 m offshore, with wave directions from the east to southeast (Short and Trenaman, 1992; Shand et al., 2011). Narrabeen-Collaroy Beach is known to experience both short-term storm and post-storm recovery responses, as well as interannual variability in overall subaerial beach volume and beach orientation due to rotation processes (Harley et al., 2015).

A Sand Blockage Assessment (refer **Appendix B**) and a Wave Climate and Scour Assessment (refer **Appendix C**) were undertaken by RHDHV as part of the design development for the works and have been used to inform the following sections on coastal processes.Coastal processes at the southern end of Collaroy beach are dominated by tidal currents, wind and swell waves and ocean currents. The following information was adapted from the Basis of Design Report for this project (RHDHV, 2021g).

Tides

Tides are semi-diurnal (two high tides and two low tides daily). Tidal hydraulic characteristics are typical of a semi-embayed beach system.

Tidal water level data nearest to site within the Sydney Harbour has been obtained, represented by tidal planes at the Fort Denison tide gauge, and are summarised in **Table 4-5** below:

Table 4-5 Tide levels (obtained November 2021)

Description	Abbreviation	Water Level (m AHD)
Highest Astronomical Tide	HAT	1.1
Mean High Water Springs	MHWS	0.6
Mean High Water	MHW	0.5
Mean High Water Neaps	MHWN	0.4
Mean Sea Level	MSL	0.0
Mean Low Water Neaps	MLWN	-0.4
Mean Low Water	MLW	-0.54
Mean Low Water Springs	MLWS	-0.6
Lowest Astronomical Tide	LAT	-1.0

Note: AHD is approximately equal to Mean Sea Level.

Waves and Storm Surge
The sources of wave activity contributing to the wave climate at the site would comprise local wind generated waves and swell waves. The adopted design significant breaking wave conditions for the stormwater outlet and seawall equal to that applied at the South Collaroy Carpark seawall, namely:

- Significant wave height (Hs) = 2.0m
- Height of 2% of waves (H2%) = 2.6m
- Wave period (Tp) = 13s

During extreme events, the water level can be elevated higher than the predicted tidal level due to low barometric pressure, wind setup and wave setup. The 100-year ARI water level including wave setup is estimated at +2.4m AHD.

Sea Level Rise (SLR)
The guidance document NSW Coastal Planning Guideline: Adapting to Sea Level Rise (Department of Planning, 2010) utilises a NSW sea level rise planning benchmark above 1990 mean sea levels; increases by 40cm by 2050 and 90cm by 2100. A such, the allowance for SLR would be adopted as 0.4m over the 50-year design life for principal elements in the stormwater outlet and replacement seawall. This SLR must be added to predicted tidal levels and elevated water levels.

Design Elevated Water Level
The recommended design elevated water level for the site is +2.4m AHD, inclusive of 0.8-0.9m wave setup, plus 0.4m to allow for SLR over the next 50 years.

Currents
Currents at South Collaroy would be mainly driven by waves in the surf zone and swash zone, and to a lesser extent from stormwater discharge. Currents could occur in a longshore or cross-shore direction. Currents are expected to be approximately 6-7 m/s within the surf zone and 2-3 m/s during peak stormwater flow events at the outlet.

The currents are relatively minor in comparison to the loading resulting from the design wave condition. Accordingly, the design wave condition governs the design of the seawall.

4.7.2 Potential Impacts

The nature, scale and extent of potential impacts to coastal processes and coastal hazards have been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment.

The proposed construction and operation of the stormwater upgrades and the replacement of the portion of the seawall from chainage 180 m to the existing stairs in front of the Collaroy Rockpool amenities building should have no significant impact on coastal processes at the site, as the works do not involve any significant modification to the existing infrastructure design and the seawall is essentially a like-for-like replacement in terms of location, wall slope and wall height. A slight shift in the alignment is proposed. Importantly, no significant impacts on coastal environmental values, coastal hazards, safe access for members of the public or the use of the surf zone are anticipated from this section of the works.

The portion of the stormwater upgrade east of the existing stairs extending to near the Collaroy Rockpool involves the installation of a RCBC conduit 2 to 3 m seaward of the existing seawall and includes a coloured concrete seawall. An assessment of impacts from this section of the works has been undertaken having regard to those items relevant to coastal processes listed under clauses 2.10, 2.11 and 2.12 of SEPP (Resilience and Hazards) 2021. Although these clauses relate to matters to be considered in the

granting of development consent (Part 4 under the EP&A Act) and the stormwater upgrade is a Part 5 matter under the EP&A Act, the clauses are considered relevant given the works fall within the coastal environment area, coastal use area and within the coastal zone generally as defined in the Coastal Management Act 2016. Clauses relevant to coastal processes and an assessment of impacts are provided in **Table 4-6**.

Localised currents generated from increases in stormwater discharge expected from the proposed outlet will be minor in comparison to wave generated flows and therefore will not significantly impact existing nearshore currents at the site.

Table 4-6 Coastal environment area, coastal use area and coastal zone clauses relevant to coastal processes

SEPP Clauses 2.10 & 2.11	Comment/Assessment
Development consent must not be granted to development on land that is within the coastal environment area (Clause 2.10) or coastal use area (Clause 2.11) unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following:	
- coastal environmental values and natural coastal processes	While the proposed stormwater upgrade works to the east of the stairs will result in a vertical seawall of similar height and location to the existing vertical seawall, its alignment will be approximately 2 to 3 m further seaward. This may be compared with the layout of the nearby South Collaroy Rockpool that protrudes to 50m from the natural shoreline and has retained the same general location for at least 80 years. Importantly the planform sweep of the upgraded seawall follows that of the existing seawall so will not present as a groyne which could potentially disrupt longshore sediment movement. The new seawall is of comparable roughness and would have no measurable influence on wave reflections and therefore beach berm levels when sand is present. The minor change in alignment of the face of the seawall will have some impact on coastal processes but the effects would not be significant and are considered to be minor. Impacts on coastal environmental values are also considered to be minor.
- existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability	The works will result in a wider promenade improving general amenity and access for users along the foreshore and to the rock pool/headland. Further, the pavement at the top of the seawall and proposed culvert will be regraded to meet disability access requirements for ramps. The existing access stairs from the promenade to the beach will be replaced in the same location with the stairs resulting in no impact to public safe access to the beach.

	Review of aerial photography indicates that the rock platform is generally exposed in front of the existing seawall to the east of the stairs but on occasion, sand accumulates. The more recent years of greatest accretion include 1994, 2004, 2008, 2013 and most recently in 2023 with sand deposits transient in nature at this location. The realignment of the seawall approximately 2 to 3 m further seaward will result in the loss of a portion of this sandy area on the occasions it would be present. However, access to the rock platform will be maintained in front of the seawall. On balance, the works would not be likely to cause a significant impact on the existing public open space or safe access to and along the foreshore, beach, headland and rock platform.
- the use of the surf zone	The proposed works would not be expected to cause an adverse impact on use of the surf zone as the works are located at the back of the beach/rock platform and may only interact with the surf in major storms. Use of the surf by beachgoers would not be expected at such times. Furthermore, sand banks off the pool which contribute to the local surf amenity respond to sand movements along the shoreline related mainly to weather cycles and swells. These sand movements would be heavily modified by the existing rock pool. The minor shift to the seawall alignment relative to the existing infrastructure would be expected to have no significant impact on these sand banks.

SEPP Clauses 2.12	Comment/Assessment
Development consent must not be granted to development on land within the coastal zone unless the consent authority is satisfied that the proposed development is not likely to cause increased risk of coastal hazards on that land or other land	The proposed works are not likely to cause an increased risk of coastal hazards. The replacement seawall being of similar slope, height and general location will continue to protect infrastructure landward of the seawall.

4.7.3 Recommended Control Measures

No control measures are required.

4.8 Air Quality

4.8.1 Existing Conditions

The existing air quality at Collaroy is primarily influenced by emissions from commercial operations, motor vehicles and residential activities. Other sources of pollution which affect air quality include house wood-fires (in winter) and bush fires (in summer). The air quality is also influenced by the prevailing weather and climatic conditions and other natural factors such as pollen.

Pittwater Road is the main route for all traffic through Collaroy and Narrabeen. It is the closest source of background air pollutants to the site consisting primarily of vehicle emissions. The road is a 60kmph, four lane highway in a predominantly residential area, and experiences some congestion around its key junctions which may be associated with pollution from standing traffic during peak times. Review of the TfNSW traffic volume viewer (accessed via Traffic Volume Viewer (nsw.gov.au) shows an average daily traffic count (for 2022) along Pittwater road of approximately 29,000 vehicles, comprising 94% cars and 6% heavy vehicles (i.e. trucks and buses).

4.8.2 Potential Impacts

The nature, scale and extent of potential impacts on air quality have been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment with the adoption of the proposed control measures.

The proposed works would have a minimal effect upon air quality, which would be limited to the duration of the works. The main pollutants emitted will be those associated with the operation of construction equipment. Excavation and the transport and/or delivery of material to site may also result in the localised, temporary generation of dust.

4.8.3 Recommended Control Measures

The potential impacts identified in **Section 4.8.2** above are expected to be short-term, low intensity and suitably managed through implementation of the following control measures:

- All plant used by the Contractor should be in good operating condition and free of excessive emissions, in accordance with the manufacturers specification to comply with all relevant regulations.
- All plant equipment and vehicles should not idle for extended periods of time; they should be switched off if not in operation.
- Weather and tide forecasts should be checked regularly during construction. Works should not be carried out during strong winds or in weather conditions where high levels of dust or airborne particulates are likely to impact surrounding recreational, marine, residential and commercial spaces.
- Uncovered or stockpiled materials that may lead to the generation of dust or windblown sand should be covered or watered down.
- Adjacent sensitive receivers should be advised to shut windows prior to the start of works that would potentially generate dust emissions, particular during moderate to strong easterly wind conditions.
- Public roads and sealed areas should be kept free of soil/dust through sweeping.

4.9 Aboriginal Heritage

4.9.1 Existing Conditions

The Northern Beaches area is known to have a rich Aboriginal history, formerly known as Guringai country; the land of the Garigal or Caregal people.

A review of potential cultural and heritage locations was undertaken using the Aboriginal Heritage Information Management System (AHIMS) search tool, indicating there are no known sites or places of Aboriginal significance within the study area declared under Section 84 of the *NP&W Act*.

4.9.2 Potential Impacts

The nature, scale and extent of potential impacts to Aboriginal Heritage have been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment with the adoption of the proposed control measures.

Considering the absence of recorded Aboriginal heritage sites it is unlikely that an Aboriginal feature will be harmed, destroyed, defaced, or damaged during construction of the works. However, there is always the potential for unknown or undiscovered finds on any site, particularly those in foreshore areas where gatherings and fishing activities may have historically occurred. Standard good practice management and control measures would be implemented when necessary, and are described in **Section 4.9.3** below.

4.9.3 Recommended Control Measures

The following control measures should be implemented to manage and mitigate potential impacts to Aboriginal heritage:

- All persons should be made aware that it is an offence under Section 86 of the National Parks and Wildlife Act 1975 to harm or desecrate an Aboriginal object unless that harm or desecration is the subject of an approved Aboriginal Heritage Impact Permit (AHIP).
- In the unlikely event that an Aboriginal object is identified whilst carrying out works during construction, works in the vicinity of the find should cease immediately and Council's Environment Officer, Aboriginal Heritage Office and DPE should be notified for advice on how to proceed.
- Should any skeletal material be uncovered during construction, works in the vicinity would cease immediately and the Contractor would contact Council's Superintendent, DPE and the NSW Police.

4.10 Non-Indigenous Heritage

4.10.1 Existing Conditions

A search of the NSW State Heritage Register, Marine Heritage Register, Commonwealth Heritage List and Warringah LEP were undertaken. No non-indigenous heritage sites were identified on the State or Commonwealth registers at the site or nearby the proposed works area. The nearest items listed in **Table 4-7** were local government listings. Listed heritage items are also annotated on **Figure 4-5**.

Table 4-7 Non-Aboriginal Heritage with Local Significance

Item name	Address	Property Description	Significance
Collaroy Rock Pool	Collaroy Beach	As shown on Heritage Map	Local (Heritage Item)

Street trees and plaque	Pittwater Road (near Birdwood Avenue)	Lots 18–20, DP 9667; Lot 7177, DP 93784; Lots 1–4, DP 68225; Lots 1 and 2, DP 117527, as shown on Heritage Map	Local (Heritage Item)
House	1071 Pittwater Road	Lot 23, DP 660056; Lot 24, Section 31, DP 13919	Local (Heritage Item)
Former Collaroy Hospital site—Development Disability Services Building and the Beach House	1 Brissenden Avenue (corner of Beach Road)	Lots 201 and 202, DP 1100018	Local (Archaeological Site)

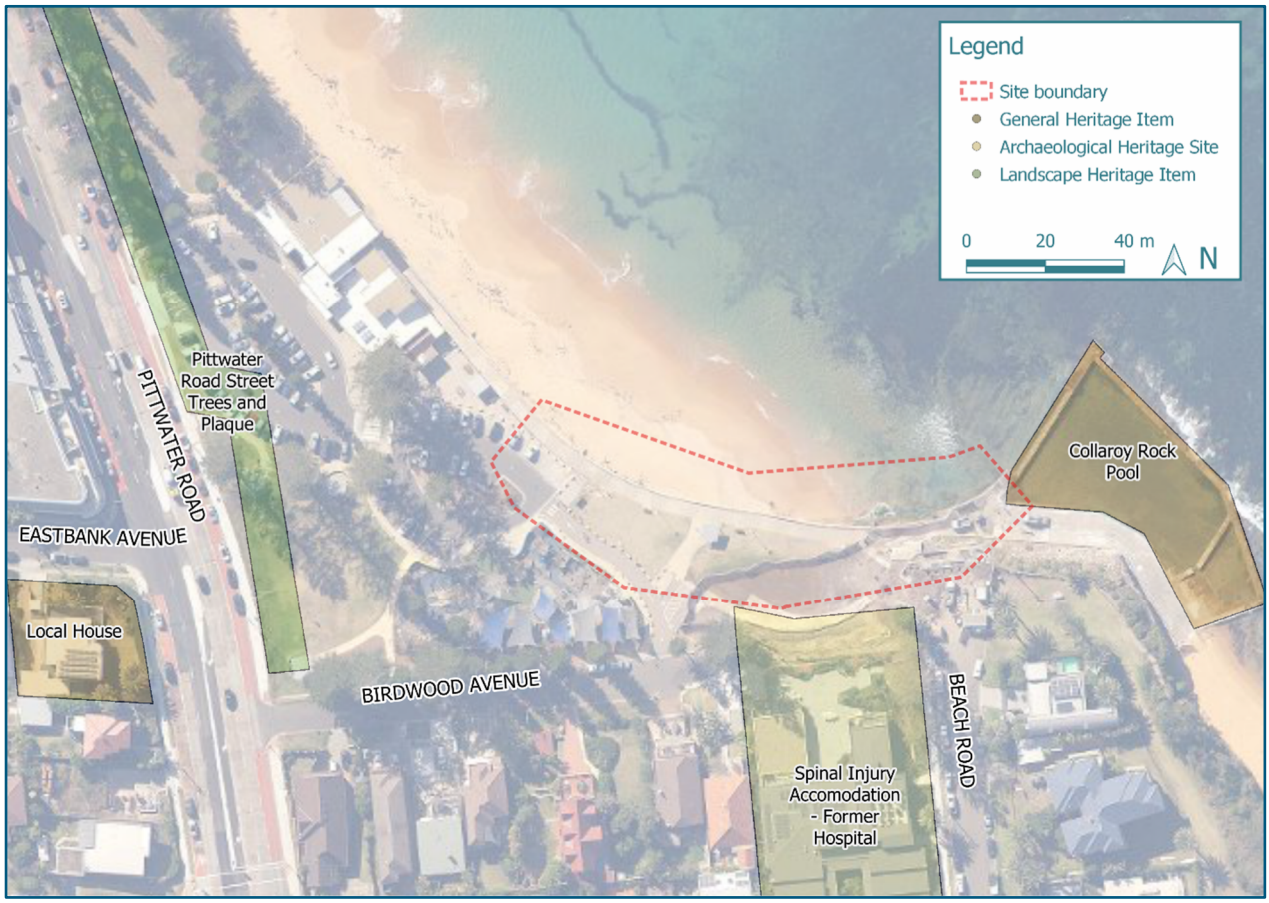


Figure 4-5 Location of Heritage Items listed on Warringah LEP 2011

4.10.2 Potential Impacts

The nature, scale and extent of potential impacts to heritage have been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment with the adoption of the proposed control measures.

The proposed works should not impact on the heritage aspects of any properties in the vicinity of the works. The Spinal Injury Accommodation heritage area shown to overlap the site boundary will not be

impacted during works. For this report, the site boundary is approximate and will not interfere with the heritage site. Upgrades to the seawall and stormwater outlet adjoining the rock pool are not expected to impact the pool's existing natural rock wall in the western corner. However, the proposed removal and relocation of the pool scupper and adjustment to the adjoining concrete suspended walkway overlapping the heritage boundary will involve demolition and reconstruction. The approximately boundary of these works are annotated in **Figure 4-6**; details are also shown in the detailed design drawings in **Appendix A**.

No other heritage areas identified will be impacted by proposed works.

Figure 4-6 Indication of portion of Collaroy Rock Pool heritage area potentially impacted by the works

4.10.3 Recommended Control Measures

The following mitigation measures should be implemented to manage and mitigate potential impacts to non-Aboriginal heritage:

- Appropriate liaison with Council's Heritage Officers should be undertaken to determine internal Council approvals for demolition and construction works potentially impacting the Collaroy Rock Pool. If the proposed works are deemed to pose significant impact on the heritage value of the rockpool, council should consider undertaking a heritage assessment in accordance with Part 5, Clause 10, Subclause 5 of the Warringah LEP. Following the Heritage Assessment, Council may consider the development of a Heritage Conservation Management Plan (HCMP) under Subclause 6 to carry out the works.
- The existing pool wall should be surveyed prior to construction and then monitored during construction.

- Review of the Spinal Injury Accommodation property boundary to ensure the construction footprint does not impact this area. It is noted that the works compound will likely infringe on this location.
- If during the course of the works previously unknown historical archaeological material or heritage items are discovered, all work in the area of the item(s) should cease immediately. Council should engage the Heritage Division, DPIE and a qualified heritage consultant, in accordance with Section 146 of the Heritage Act, to determine an appropriate course of action prior to the recommencement of work in the area of the item.

4.11 Transport, Parking and Pedestrian Access

4.11.1 Existing Conditions

Pittwater Road is the main transport route for Collaroy and Narrabeen. It is a 60kmph, four lane highway in a predominantly residential area, and experiences some congestion around its key junctions with Collaroy Street, Mactier Street and Ocean Street. An average daily traffic count of approximately 29,000 along Pittwater Road was obtained from data collated this year (2022) via TfNSW traffic volume viewer (accessed via Traffic Volume Viewer (nsw.gov.au). Key residential streets adjacent to the site boundary include Birdwood Avenue and Beach Road.

Parking within and adjacent to the proposed works includes the Collaroy SLSC, Collaroy Beach South carpark including disabled parking spaces, residential street parking along Birdwood Avenue and Beach Road, and two disabled parking spaces at the entrance to Collaroy Beach South carpark on Birdwood Avenue.

Various access pathways exist within the proposed project site, providing beach, rock pool, playground, carpark, street and reserve access.

Figure 4-7 provides an overview of the key transport, parking and pedestrian access areas to be considered as part of construction activities.

Figure 4-7 Key transport, parking and pedestrian access areas relative to the site

4.11.2 Potential Impacts

The nature, scale and extent of potential impacts to transport, parking and pedestrian access have been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment with the adoption of the proposed control measures.

Key roads and residential streets in proximity to the project area will not be significantly impacted by the proposed construction works. Findings from the Constructability Assessment (based on the 20% Detailed Design Drawings) (RHDHV, 2021c) suggest site compound access will most likely be via the Collaroy Beach South carpark entrance on Birdwood Avenue, which may generate minor congestion and traffic hazards along Birdwood Avenue during busy construction periods.

Access to the rock pool, particularly disabled access during construction, has been identified during community consultation as a key concern. The rock pool may be closed for a period of approximately 4-6 weeks while the rock pool pump cable is relocated and the downstream portion of the works are completed, subject to the Contractor's methodology.

A constructability assessment with Council and Fontalis Project Services (RHDHV, 2022) identified a possible 8–12 week period of no disabled access to the rock pool is expected during installation of the seawall and stormwater culvert works. Contractor escorts for disabled access has been considered as a potential option to allow disabled access during this period, however, this option is unlikely to be accepted by a contractor due to safety concerns. General public access to the pool during this 8 -12 week period may still be possible from the track on the eastern side of Beach Road which leads to the eastern side of

the headland, but only after the pool pump cable has been relocated and the downstream portion of the works have been completed. All timeframes will depend on the Contractor's methodology and consideration for pedestrian and vehicle safety.

Parking at south Collaroy is not expected to be significantly impacted considering the temporary nature of the proposed works. Impacts will include only minor usage of residential street parking on Birdwood Avenue (e.g. trucks waiting to enter site and replacement of general or disabled parking spaces impacted in the beach carpark), impact on parking at the eastern extent of the Collaroy Beach South carpark and use of the northern end of Beach Road for crane activities (if required). Following the constructability assessment, it was determined that approximately ten car general spaces and two disabled parking spaces in the Collaroy Beach carpark may be impacted during the works. Further, two disabled parking spaces at the carpark entrance off Birdwood Avenue will be impacted by the compound. Approximately six spaces at the northern end of Beach Road would be impacted by the proposed crane location (if required).

The carpark entrance off Birdwood Avenue will be used for the site compound and will be inaccessible to the public during the works.

Consideration should be also given for a temporary Contractor carparking site adjacent to the compound.

4.11.3 Recommended Control Measures

The following control measures should be implemented for the management of vehicle and pedestrian access:

- The general parking spaces in the Collaroy Beach carpark which are impacted by the works may be moved to Birdwood Avenue, while the impacted disabled spaces in the carpark will be moved elsewhere in the beach carpark, as close to their existing location as possible. The disabled parking on the carpark entrance off Birdwood Avenue will be replaced on Birdwood Avenue or in the Collaroy Beach carpark.
- Pedestrian access to the pool after construction of the downstream portion of the culvert will be maintained via a temporary footpath along the playground, around the southern extent of the site compound and towards the amenities building. A pedestrian gate across the site entrance will be provided. Pedestrian access will be subject to the Contractor's methodology and consideration of safety.
- Preparation of a Traffic Management Plan (TMP) for the proposed works, with particular focus on Birdwood Avenue and the adjoining Collaroy South Carpark entrance way, the cul-de-sac on Beach Road, and all pedestrian pathways within the construction footprint.
- Appropriate signage should be erected informing the public of the temporarily changed traffic and parking conditions, and any restricted access.
- All practical measures should be implemented by the contractor to facilitate public access to the beach and rock pool during construction, particularly minimising the stages whereby disabled access is not possible. Alternative measures to access should be considered by the Council such as construction contractor escorts through restricted areas.
- The community should be notified of construction activities, particularly those that will restrict access to the use of public amenities such as the rock pool, and be provided with a mechanism (e.g. phone number) for any complaints to be submitted.
- Prior to commencement of works, boundaries of the construction area(s), site compounds and access points should be marked with temporary barrier fencing and signage. The fencing should be monitored daily by the site supervisor, be immediately repaired or replaced if necessary and should be removed when construction is completed.

- Machinery and heavy vehicles should only access the defined work sites via clearly defined routes.
- Pedestrian access within the works area should not be permitted for the duration of the works. Where normal construction fencing cannot be practically used then star pickets and para-webbing, or similar, and clear and obvious signage should be employed.
- General construction signage should be erected in a publicly visible location to inform the community of the construction activities (locations, working hours, duration of works).
- Workers and plant drivers should always maintain awareness of other users, including the use of spotters when vision is impeded.
- Contractor carparking could be provided in the grassed area west of the playground by laying down a geofabric layer with gravel.

4.12 Visual Amenity and Landscape Character

4.12.1 Existing Conditions

The existing visual amenity of the area is characterised by open space, the Collaroy Beach Surf Life Saving Club (SLSC), the regional playground, Collaroy rockpool, public amenities, commercial premises and residential properties. Collaroy-Narrabeen Beach and adjacent reserves are popular spaces for public recreation such as surfing, fishing, Surf lifesaving clubs, swimming, sunbathing, running/exercising. The nearby streets and roads primarily comprise residential and commercial properties.

4.12.2 Potential Impacts

The nature, scale and extent of potential impacts to visual amenity and landscape character have been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment with the adoption of the proposed control measures.
The open nature of the beach and foreshore would mean the construction work sites would be highly visible by the public, detracting from the visual amenity of the nearby area during the period of construction.

Impacts to landscape are expected during the construction phase with the presence of workers, plant and associated works infrastructure (as required). This is a time-limited impact which would occur during the various stages of the works.

Construction works are expected to have a significant positive impact on the visual amenity of the area following removal of the temporary rock bags, renewal of the seawall and restoration/ revegetation activities.

Following construction, no adverse impacts on the visual amenity and scenic qualities of the coast, including coastal headlands are anticipated. Similarly, no overshadowing, wind funnelling or loss of views from public places to foreshores are anticipated.

4.12.3 Recommended Control Measures

After the works, the site should be returned to pre-activity landscape conditions. In particular, within the reserve central to the proposed works (ref. **Figure 1-1**) grassed areas will be returfed and any disturbed infrastructure such as picnic benches, bins and light poles re-instated.

No further recommended safeguards and mitigation measures relevant to visual amenity are considered necessary.

4.13 Services and Utilities

4.13.1 Existing Conditions

Based off design drawings shown in **Appendix A**, water, sewerage, and electrical services have been identified within the immediate construction area. Gas and telecommunication services have been mapped nearby in the project area along Birdwood Avenue and should not be impacted by the proposed works.

4.13.2 Potential Impacts

Service and utility strike during construction and operational phase intrusive activities can carry several moderate to severe impacts including service interruptions, repair costs, injury and even death. An existing Sydney Water sewermain and sewer manholes near the amenities building may be subject to vibrational impacts and construction loadings.

4.13.3 Recommended Control Measures

Appropriate clearance should be maintained to existing services, including review of available site service plans and Before You Dig Australia (BYDA) plans, followed by physical service clearance by an accredited service locator, which may include non-destructive drilling techniques.

Consultation with utilities companies should be undertaken to confirm the presence of any unidentified services and if required, a Quality Level A assessment in accordance with the Australian standards (AS5488 – 2013) for utilities should be undertaken.

The works are close to the existing sewer-main and manholes, however are not expected to impact these services. Coordination with Sydney Water was undertaken, and a Building Plan Approval by a registered Water Services Coordinator (WSC) was Sydney Water for approval. All of the required protection and control measures specified in the application to Sydney Water will be followed by the Contractor, to ensure that there is no impact to the existing sewer.

4.14 Waste Management

4.14.1 Existing conditions

Limited garbage or other forms of waste are generally present within the proposed construction area. Outside of storm events, the sites are clean and free of waste issues.

Waste inputs would most likely be confined to that left by recreational users and any material deposited by incoming tides and/ or waves.

4.14.2 Potential Impacts

The nature, scale and extent of potential impacts due to waste has been assessed and evaluated and it is concluded that the works are unlikely to have a significant impact on the environment with the adoption of the proposed control measures.

The generation of waste during construction is unavoidable and should be managed appropriately in accordance with Council's Waste Management Guidelines (NBC, 2016) and relevant NSW EPA waste guidance.

Waste streams from construction activities are likely to include demolition rubble (i.e. concrete and sandstone), excavation spoil (both fill and natural soils), concrete (from culvert, wall and pit construction) and general construction wastes such and materials packaging and food/ drink packaging.

The mismanagement of construction wastes can lead to pollution, the unnecessary contribution to landfill, alongside costly disposal fees if materials aren't appropriately classified for re-use or disposal.

4.14.3 Recommended Control Measures

The following control measures should be implemented for the management of waste during construction activities:

- Management of waste should align with the "waste hierarchy principle of avoidance, resource recovery and disposal" detailed in Council's Waste Management Guidelines (NBC, 2016). Additionally, guidance provided in the "Re-use and recycling opportunities" table should be followed where practicable. Specifically the re-use of rock bags following removal and/ or use of excavated materials and/ or concrete as re-use for filling or levelling. Accordingly, subject to waste classification and if approved by a geotechnical engineer, rubble and other granular materials may be buried landward of the seawall.
- All waste generated during the construction activities should be appropriately contained before re-use, relocation and/ or disposal off-site to prevent it from entering the marine environment.
- Excavated materials and demolition rubble should be appropriately classified prior to either re-use on site or disposal at a licensed waste facility such as Kimbriki Resource Recovery Centre (http://www.kimbriki.com.au/).
- If visual inspection of any soils designated for offsite disposal indicates contamination may be present, the soils should be tested for potential contamination, classified, stored, transported, and disposed of at an appropriately licensed waste facility in accordance with NSW Waste Classification Guidelines (NSW EPA, 2014). Additionally, a UFP should be prepared and implemented as part of the CEMP to facilitate effective management of contaminated material found during excavation works.
- Any temporary stockpiles of waste should be appropriately covered and/or contained (e.g. bunding) to ensure no waste is washed or blown back into the marine environment.
- General waste bins should be available for use onsite and disposed of at a license facility frequently.
- Washout of trucks and cleaning of equipment and/or vehicles used during the works should not be undertaken in locations that permit flow of untreated wastewater directly to the open drainage system.
- Upon completion of the works, the site should be cleared of all surplus materials and any remaining waste created by the works.

4.15 Cumulative Impacts

Clause 171 of the Environmental Planning and Assessment Regulation 2021 requires the cumulative environmental impacts of the activity to be considered with other existing or likely future related activities. The Works considered in this REF (Stage 1) are the most significant augmentation of the stormwater network proposed in this location. However, further renewal, augmentation or construction of new stormwater infrastructure is likely in future years. These works include:

- Stage 1: Seawall and stormwater outlet upgrade (current REF)
- Stage 2: Stormwater upgrade from Alexander St to Seawall
- Stage 3: New GPT in Collaroy Beach carpark

- Stage 4: Northern alignment and outfall demolition (potentially following significant investigation and community consultation)
- Stage 5: New GPT at Collaroy St

Refer to **Figure 4-8** for the overall design scheme of the current and proposed future stages.

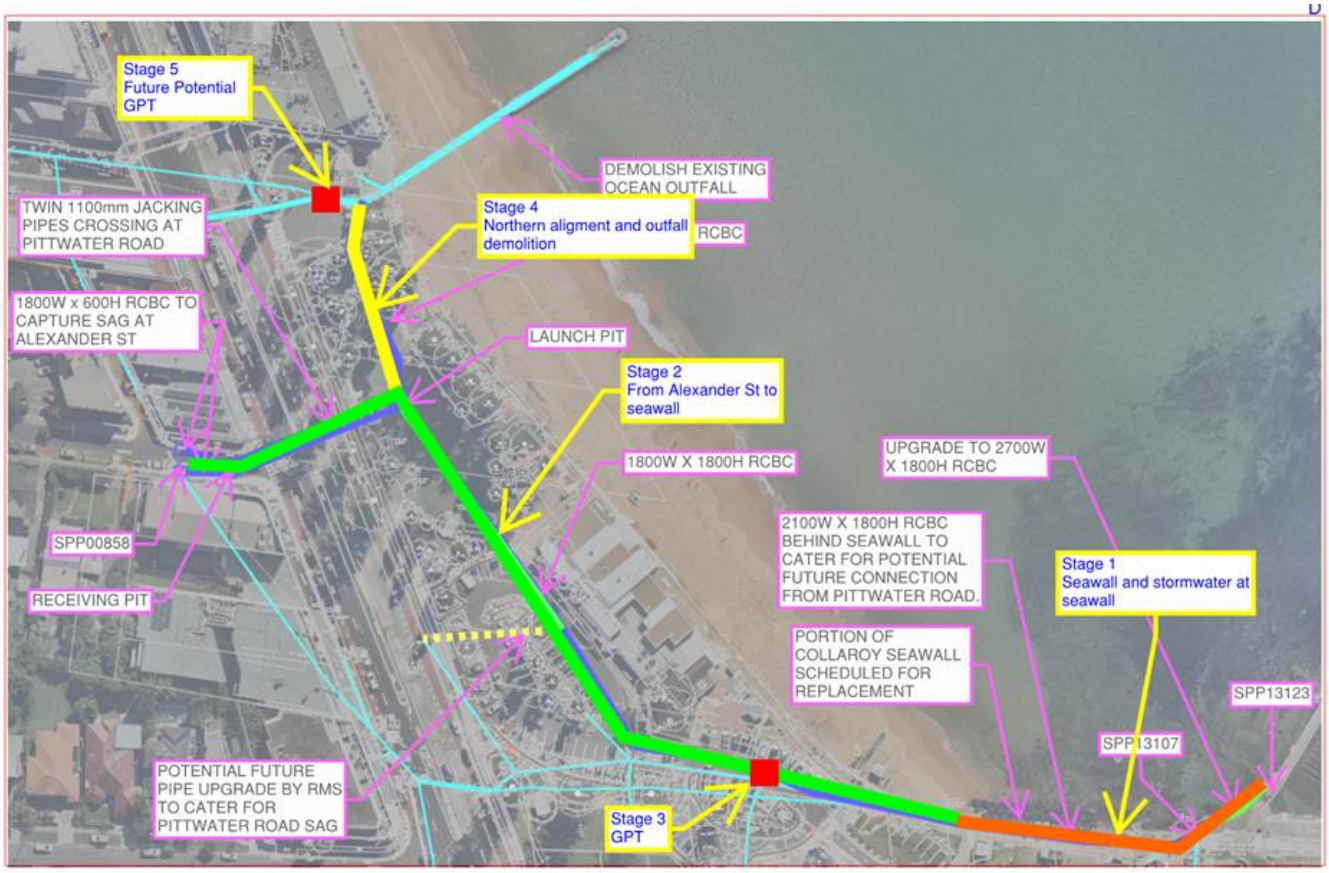


Figure 4-8 Proposed Stage 1 and potential future stormwater network works

The potential impacts and compliance with the relevant legislation for the Stage 1 works are covered in detail within this REF. Stages 2,3, and 5 will occur within the extent of the existing stormwater asset network as well as landward of the existing beach and seawall. Therefore, it can be concluded that these will not significantly impact coastal processes,.

Any minor or temporary impacts such as public access and noise related to the construction of the future works can be suitably assessed and addressed in the approval process and Construction Environmental Management Plans when the complete detail and scheduling of these works is understood.

The works proposed as part of Stage 4 will require significant investigation into potential design options and public consultation. The appropriate impact assessment for this work will be undertaken as part of the design and approval for these works. Broadly the removal or shortening of this structure would be expected to improve amenity in the location of the works and not significantly impact coastal processes within the embayment, however this would be assessed as part of the Stage 4 works.

Other coastal protection work along Collaroy Beach and potentially housing development may occur in the area and may coincide with the proposed works. At the construction phase a minor cumulative increase in

traffic, noise and dust is possible arising from concurrent activity. However, provided that the mitigation measures identified within this and future REF's for future works are adhered to, the cumulative impact would be reduced to a minimum.

Positive cumulative environmental and social impacts would result from operation of these works including improved protection of public land, improved amenity and improved public safety.

Therefore, the proposed activity is not likely to have a significant cumulative environmental effect with other existing or likely future activities.

4.16 Constructability

The proposed 20% detailed designs for Stage 1 Option D works, available at the time of writing, are considered to be constructible. Refer to the Constructability Assessment (RHDHV, 2022) for a full discussion of the constructability at 20% Detailed Design.

5 Environmental Management

5.1 Environmental Management Plan

A site-specific construction environmental management plan (CEMP) should be prepared by the Contractor and approved by Council prior to commencement of construction. The Contractor would implement the CEMP during the works and would be responsible for selecting appropriate control measures for the potential impacts identified in this REF. The CEMP should be compliant with the Contract technical specifications.

The CEMP would ensure that:

- appropriate control measures for the potential impacts are implemented on the site;
- activities are carried out with due diligence; and,
- all activities comply with relevant environmental legislation including conditions of approval, Acts and Regulations, and Standards and Best Management Practices.

With the implementation of the CEMP environmental controls there would not be expected to be significant environmental impacts during construction.

5.2 Summary of Environmental Control Measures

Table 5-1 provides a summary of the recommended environmental control measures detailed in **Section 4**, that should be implemented to avoid or mitigate potential impacts from the proposed stormwater and seawall redevelopment works described in **Section 1.5**.

Table 5-1 Summary of environmental control measures

Environmental Control Measures
Soils and Geology – Section 4.2
1. Soil and rock recovered during the works should be reused where possible, in accordance with the Council's Waste Minimisation Guidelines (NBC, 2016).
2. Any excess excavated beach sands should remain part of the active beach system.
3. A UFP should be prepared and incorporated in the CEMP to facilitate effective management of contaminated material found during excavation works.
4. If ASS is identified during excavation of subsurface materials, an ASSMP should be prepared to avoid environmental degradation if soils which are to be disturbed are found to contain actual or potential ASS.
5. Temporary stockpiles should be protected with diversion drains, silt fences and straw bales to prevent soil loss.
6. Tracking of soil from the construction site via construction equipment onto the roads should be minimised by cleaning of any machinery in a designated washdown area.
Water Quality – Section 4.3
Construction
7. Construction phase erosion and sediment control measures should be installed and maintained by the contractor in accordance with Council's requirements and the guideline Managing Urban Stormwater, Soils and Construction ('the Blue Book') (Landcom, 2004).

Environmental Control Measures
An ESCP should be prepared as part of the detailed design stage and integrated into the CEMP. The ESCP is to incorporate measures to prevent the discharge of soil and waterborne pollutants beyond the extent of work during and immediately following construction. The following control measures should be implemented as a minimum: • Stabilised site access at all entry and exit points to the extent of work. • Further sediment controls installed at the seawall to prevent erosion/sedimentation in these areas. • Implementation of filters / sediment traps at all kerb drainage inlets. • Installation of sediment fence along the extent of works. • Appropriate management of any stockpiled materials such as covering or watering. Stockpiled materials to be located an appropriate distance away from the beachfront. • Stockpiles should be located on flat ground at least 5 metres away from areas subject to run-off and away from established flow paths (e.g. drains, gutters, etc.). The height of the stockpiles should not exceed 2 metres unless stockpiles are suitably protected from wind erosion. • Additional sediment controls (e.g. curtains, hay bales etc.) will be held onsite for the duration of the works and used for any unforeseen sedimentation issues. • Rehabilitation and revegetation of disturbed areas (in particular the beachfront) as soon as practical to promote sand and sediment stabilisation.
8. A water treatment tank or baffle tank should be used to settle out solids within groundwater captured in excavation pits prior to discharge into stormwater. Water quality around the seawall must be monitored to determine whether treatment of groundwater is required.
9. Implementation of an effective spill and leakage procedure with the following control measures should be implemented as a minimum: a. The use of sand berm, sand-filled geocontainer wall or rock bags to protect against seepage and the escape of concrete or other pollutants from the site. b. Emergency spill kits should be kept on-site at all times and maintained throughout the construction work. The spill kit must be appropriately sized for the volume of substances at the work site. A spill kit would be kept on heavy plant and in the temporary construction compound site. c. Small carrying plant or machinery should be fitted with bunding around equipment to prevent accidental spills or leaks from entering the water. d. If a spill occurs, the Council contract manager and environment staff should be notified as soon as practicable. e. All staff should be made aware of the location of spill kits and trained in their use. f. The contractor should ensure that all plant is maintained in good working order with regular servicing. g. No major maintenance of equipment should be undertaken on-site. h. Daily inspections of plant, minimisation of fluids on site, and proper procedures for refuelling and maintenance need to be observed.
Operation
10. Installation of a large Gross Pollutant Trap(s) (GPTs) is proposed to address the gross water quality impacts associated with diverting stormwater to the rock pool outlet, and as such any changes to gross water quality conditions will be mitigated. A feasibility study has been undertaken by RHDHV to GPT requirements including sizing and optimal locations. In installation of GPTs would be undertaken as part of future works stages.
Hydrology and Hydrogeology – Section 4.4
11. Shallow groundwater will need to be taken into account for all excavations, de-watering is likely to be required, e.g. through “spear points” around the excavation. All dewatering measures would need to be undertaken in line with any water use licences which may be required by Water NSW.
12. To mitigate the potential water quality impacts from groundwater inflows, a water treatment tank or baffle tank would likely be required to settle out solids prior to discharge to stormwater, or if contaminated to sewer through a Trade Waste Agreement (TWA).

Environmental Control Measures
13. Procedures for the control of leaks and spills on site should be undertaken in accordance with those outlined for water quality in bullet point 9.
14. Dewatering may result in settlement of adjacent structures and will need to be monitored by the Contractor.
Noise and Vibration – Section 4.5
15. Works should be undertaken during the standard construction hours where practicable (i.e. 7.00 am to 5.00 pm Monday to Friday and 8.00 am to 1.00 pm Saturdays, with no work to be undertaken on Sundays and Public Holidays), in accordance with the NSW ICNG guidelines. On occasion works may be required outside of the standard hours to take advantage of available daylight hours and suitable tide conditions. Where works are required outside of the standard hours, notification will need to be provided to local residents by Council.
16. Noise management levels (NMLs) should be maintained in accordance with ICNG guidelines of RBL + 10dB for noise affected areas in standard working hours, RBL + 5 dB for noise affected areas outside of recommended working hours, and a maximum of 75 dB(A) for highly affected area (i.e. within 25 m of the works area).
17. Construction personnel should be informed of the location of sensitive receivers, and the need to minimise noise and vibration from the work, through the site induction and regular toolbox talks.
18. Beach users and surrounding residences and businesses should be notified of the proposed works and hours of operation.
19. A Council contact should be provided for the works in the event of any complaints.
20. Instructions should be issued to the Contractor that appropriate silencers are to be fitted on all plant and equipment.
21. Works should be undertaken in the non-peak visitor and recreation periods if possible (i.e. during winter months.
22. Plant should be turned off when not in use (i.e. not left idling).
23. Noisy plant and equipment should be oriented away from sensitive receivers where possible.
24. The use of horns and alarms should be minimised to the extent possible while satisfying legislative requirements.
25. High vibration methods should be substituted with lower vibration methods where possible, particularly in relation to demolition, sheet piling and ground excavation/ compaction works.
26. If vibration impacts on nearby structures (i.e. the public amenities block and rock pool wall) are deemed a concern, the physical integrity of each structure should be inspected by a structural engineer and/ or a dilapidation survey conducted to identify/ assess potential structural impacts prior to works commencing.
Biodiversity – Section 4.6
27. Incorporation of a habitat conscious seawall design for intertidal species, such as through the provision of artificial rock pool attachment (recommended by NSW DPI Fisheries during consultation) to the seawall, would not be able to survive the marine wave climate.
28. An effective spill and leakage procedure should be implemented in accordance with control measures outlined for water quality in bullet point 9.
29. Minimise loud and abrasive works below the MHWM where possible.
30. Contractor should cease work activities and notify Council if fauna species are observed to persistently occupy areas in the immediate vicinity of work zones.
31. If native fauna is injured, immediate contact should be made with a wildlife rescue service or a veterinary surgeon.

Environmental Control Measures
32. Revegetation of site should use only local native plant species (if required), preferably grown from local stock. If possible, plants that are in areas that are to be excavated or accessed shall be carefully dug up and appropriately stored for replanting after construction work.
33. When revegetating sites, the following plants should not be used and shall be controlled in according to a weed management plan for the sites: • Plant species listed as weeds by NSW Department of Primary Industries (http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles) • Plant species listed as part of key threatening processes (http://www.environment.nsw.gov.au/threatenedspecies/KeyThreateningProcessesByDoctype.html)
Air Quality – Section 4.8
34. All plant used by the Contractor should be in good operating condition and free of excessive emissions, in accordance with the manufacturers specification to comply with all relevant regulations.
35. All plant equipment and vehicles should not idle for extended periods of time; they should be switched off if not in operation.
36. Weather and tide forecasts should be checked regularly during construction. Works should not be carried out during strong winds or in weather conditions where high levels of dust or airborne particulates are likely to impact surrounding recreational, residential, marine and commercial spaces.
37. Uncovered or stockpiled materials that may lead to the generation of dust or windblown sand should be covered or watered down.
38. Adjacent sensitive receivers should be advised to shut windows prior to the start of works that would potentially generate dust emissions, particular during moderate to strong easterly wind conditions.
39. Public roads and sealed areas should be kept free of soil/dust through sweeping.
Aboriginal Heritage – Section 4.9
40. All persons should be made aware that it is an offence under Section 86 of the National Parks and Wildlife Act 1975 to harm or desecrate an Aboriginal object unless that harm or desecration is the subject of an approved Aboriginal Heritage Impact Permit (AHIP).
41. In the unlikely event that an Aboriginal object is identified whilst carrying out works during construction, works in the vicinity of the find should cease immediately and Council's Environment Officer, Aboriginal Heritage Office and DPIE should be notified for advice on how to proceed.
42. Should any skeletal material be uncovered during construction, works in the vicinity would cease immediately and the Contractor would contact Council's Superintendent, DPIE and the NSW Police.
Non-Aboriginal Heritage – Section 4.10
43. Appropriate liaison with Council's Heritage Officers should be undertaken to determine internal Council approvals for demolition and construction works potentially impacting the Collaroy Rock Pool. If the proposed works are deemed to pose significant impact on the heritage value of the rockpool, council should consider undertaking a heritage assessment in accordance with Part 5, Clause 10, Subclause 5 of the Warringah LEP. Following the Heritage Assessment, Council may consider the development of a Heritage Conservation Management Plan (HCMP) under Subclause 6 to carry out the works.
44. The existing pool wall should be surveyed prior to construction and then monitored during construction.
45. Review of the Spinal Injury Accommodation (heritage site) property boundary should be undertaken to ensure the construction footprint does not impact this area. It is noted that the works compound will likely infringe on this location.

Environmental Control Measures
46. If during the course the works previously unknown historical archaeological material or heritage items are discovered, all work in the area of the item(s) should cease immediately. Council should engage the Heritage Division, DPE and a qualified heritage consultant, in accordance with Section 146 of the *Heritage Act*, to determine an appropriate course of action prior to the recommencement of work in the area of the item.
Transport, Parking and Pedestrian Access – Section 4.11
47. The general parking spaces in the Collaroy Beach carpark which are impacted by the works may be moved to Birdwood Avenue, while the impacted disabled spaces in the carpark will be moved elsewhere in the beach carpark, as close to their existing location as possible. The disabled parking on the carpark entrance off Birdwood Avenue will be replaced on Birdwood Avenue or in the Collaroy Beach carpark.
48. Pedestrian access to the pool following construction of the downstream portion of the culvert will be maintained via a temporary footpath along the playground, around the southern extent of the site compound and towards the amenities building. A pedestrian gate across the site entrance will be provided. Pedestrian access will be subject to the Contractor's methodology and consideration of safety.
49. A Traffic Management Plan (TMP) for the proposed works, with particular focus on Birdwood Avenue and the adjoining Collaroy South Carpark entrance way, the cul-de-sac on Beach Road, and all pedestrian pathways within the construction footprint should be prepared.
50. Appropriate signage should be erected informing the public of the temporarily changed traffic and parking conditions, and any restricted access.
51. All practical measures should be implemented by the contractor to facilitate public access to the beach and rock pool during construction, particularly minimising the stages whereby disabled access is not possible. Alternative measures to access should be considered by the Council and construction contractor escorts through restricted areas.
52. The community should be notified of construction activities, particularly those that will restrict access to the use of public amenities such as the rock pool, and be provided with a mechanism (e.g. phone number) for any complaints to be submitted.
53. Prior to commencement of works, boundaries of the construction area(s), site compounds and access points should be marked with temporary barrier fencing and signage. The fencing should be monitored daily by the site supervisor, be immediately repaired or replaced if necessary and should be removed when construction is completed.
54. Machinery and heavy vehicles should only access the defined work sites via clearly defined routes.
55. Pedestrian access within the works area should not be permitted for the duration of the works. Where normal construction fencing cannot be practically used then star pickets and para-webbing, or similar, and clear and obvious signage should be employed.
56. General construction signage should be erected in a publicly visible location to inform the community of the construction activities (locations, working hours, duration of works).
57. Workers and plant drivers should always maintain awareness of other users, including the use of spotters when vision is impeded.
58. Contractor carparking could be provided in the grassed area west of the playground by laying down a geofabric layer with gravel.
Visual Amenity and Landscape Character – Section 4.12
59. After the works, the site should be returned to pre-activity landscape conditions. In particular, within the reserve central to the proposed construction area, grassed areas should be returfed and any disturbed infrastructure such as picnic benches, bins and light poles re-instated
Services and Utilities – Section 4.13

Environmental Control Measures
60. Appropriate clearance should be maintained to existing services, including review of available site service plans and Before You Dig Australia (BYDA) plans, followed by physical service clearance by an accredited service locator, which may include non-destructive drilling techniques.
61. Consultation with utilities companies should be undertaken to confirm the presence of any unidentified services and if required, a Quality Level A assessment in accordance with the Australian standards (*AS5488 – 2013)* for utilities should be undertaken. The works are close to the existing sewer-main and manholes, however are not expected to impact these services. Coordination with Sydney Water was undertaken, and a Building Plan Approval by a registered Water Services Coordinator (WSC) was Sydney Water for approval. All of the required protection and control measures specified in the application to Sydney Water will be followed by the Contractor, to ensure that there is no impact to the existing sewer.
Waste Management – Section 4.14
62. Management of waste should align with the "waste hierarchy principle of avoidance, resource recovery and disposal" detailed in Council's Waste Management Guidelines (NBC 2016). Additionally, guidance provided in the "Re-use and recycling opportunities" table should be followed where practicable. Specifically the use of excavated materials and/ or concrete as re-use for filling or levelling. Accordingly, subject to waste classification and if approved by a geotechnical engineer, rubble and other granular materials may be buried landward of the seawall.
63. All waste generated during the construction activities should be appropriately contained before re-use, relocation and/ or disposal off-site to prevent it from entering the marine environment.
64. Excavated materials and demolition rubble should be appropriately classified prior to either re-use on site or disposal at a licensed waste facility such as Kimbriki Resource Recovery Centre (http://www.kimbriki.com.au/)
65. If visual inspection of any soils designated for offsite disposal indicates contamination may be present, the soils should be tested for potential contamination, classified, stored, transported, and disposed of at an appropriately licensed waste facility in accordance with NSW Waste Classification Guidelines (NSW EPA, 2014).
66. Any temporary stockpiles of waste should be appropriately covered and/or contained (e.g. bunding) to ensure no waste is washed or blown back into the marine environment.
67. General waste bins should be available for use onsite and disposed of at a license facility frequently.
68. Washout of trucks and cleaning of equipment and/or vehicles used during the works should not be undertaken in locations that permit flow of untreated wastewater directly to the open drainage system.
69. Upon completion of the works, the site should be cleared of all surplus materials and any remaining waste created by the works.

6 Environmental Factors Considered

6.1 Consideration of Factors in Clause 171 of the EP&A Regulation

Clause 171 of the *EP&A Regulation* provides a list of factors that must be considered in determining the likely impacts of an activity on the natural and built environment and therefore the possible necessity for an EIS.

Table 6-1 provides a summary of factors requiring consideration based on the impact assessment detailed in this report.

Table 6-1 Summary of key environmental factors considered in accordance with Clause 171 of the EP&A Regulation

Factor	Impact	Section in this REF
a. Any environmental impact on a community? Minor temporary impacts to able and disabled pedestrian access to the Collaroy Rock Pool during parts of construction. Additionally, minor impact to sensitive residential noise receptors during out of hours works (i.e. opportunistic works during low tides and to maximise daylight hours).	Pedestrian access, and out of hours work noise impacts are minor and short-term with appropriate mitigation measures implemented.	4.11 & 4.12
b. Any transformation of a locality? The locality will maintain the same infrastructure (i.e. stormwater line and seawall), therefore, any transformations will be temporary and the locality will be restored to the pre-construction aesthetic upon completion of the works.	Nil	4.12
c. Any environmental impact on the ecosystems of the locality? Construction works will potentially impact the habitat structure of the intertidal zone during seawall and stormwater outlet upgrades, in addition to the possible water quality impacts via the increased stormwater discharge expected from the upgraded outlet, and release of toxicants either from embankment soils (unlikely based off soil profiled in previous intrusive investigations onsite and nearby) or plant/ machinery leaks and spills.	Minor and short-term habitat structure and water quality impacts to the onsite and nearby marine and intertidal ecosystems during construction and operational phases (stormwater discharge only) with appropriate mitigation measures implemented.	4.6
d. Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? Environmental quality or value will not be reduced.	Nil	4.12
e. Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? Access to Collaroy Rock Pool (place of heritage and social value) during discrete construction periods.	Impacts to the heritage value of Collaroy Rock Pool are considered minor with construction not expected to impact the natural rock. Control measures considered appropriate to manage the heritage value prior to construction and mitigate any significant impacts. Impacts to pedestrian access short-term with appropriate mitigation measures implemented.	4.9 & 4.10
f. Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? Nil effects	Nil	4.6
g. Any endangering of any species of animal, plant or other form of life whether living on land, in water or in the air?	Impacts to intertidal marine organisms considered minor and short-term and impacts to migratory birds	4.6

Factor	Impact	Section in this REF
Potential interferences with intertidal organisms (i.e. filamentous green algae, sea lettuce and sessile organisms) during the seawall and stormwater outlet redevelopment, water quality health effects on inhabitation marine organisms, and behavioural disturbances to migratory birds from construction presence and noise.	considered very unlikely with appropriate mitigation measures implemented.	
h. **Any long-term effects on the environment?** Nil effects	Nil	4.15
i. **Any degradation of the quality of the environment?** Nil effects	Nil	4.3 & 4.8
j. **Any risk to the safety of the environment?** General construction works poses a safety risk to both the human and ecological environment.	Considered appropriately managed with mitigation measures implemented.	4.11
k. **Any reduction in the range of beneficial uses of the environment?** As per *Factor (a)*, impact to pedestrian access to the Collaroy Rock Pool during parts of construction. Pedestrian emergency services access also impacted during rock pool closure. Emergency services access to the carpark via Birdwood Avenue may also be impacted making it preferable for emergency services to access the car park via Pittwater Road for the duration of construction	Pedestrian and emergency services access impacts are minor and short-term with appropriate mitigation measures implemented.	4,11
l. **Any pollution of the environment?** Construction activities will potentially impact water quality via uncontrolled runoff and air quality via dust and emissions. Increases in overall stormwater discharge to the proposed outlet creates a potential impact to water quality during the operational phase. Potential for construction and demolition waste pollution during works and general waste production by workers.	Water quality and air quality impacts minor and short-term with appropriate mitigation measures implemented. Gross pollution impact considered low to negligible with appropriate mitigation measures implemented.	4.3, 4.8 & 4.14
m. **Any environmental problems associated with the disposal of waste?** Construction and demolition waste, and excavated spoil may impact the environment through unnecessary contribution to landfill if not management appropriately.	Environmental problems corresponding with waste disposal considered low to negligible with appropriate mitigation measures implemented.	4.14
n. **Any increased demands on resources (natural or otherwise) that are or are likely to become in short supply?** No increase in demand of resources.	Nil	4.2 & 4.7
o. **Any cumulative environmental effect with other existing or likely future activities?** Nil effects.	Nil	4.15

Factor	Impact	Section in this REF
p. **Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?** No significant impacts identified.	Nil	4.7

Following a review of key environmental factors considered, the proposed works are not considered to result in significant impacts either onsite or to the surrounding environment. Therefore, it is concluded that an EIS is not required, and this REF is considered an appropriate environmental assessment.

During construction of the downstream portion of the works, the pool will be closed and access to the pool from the shore will not be possible during this time. These arrangements should be communicated to the SLSC so that they can make alternative arrangements – e.g. rubber ducky boat. Once the first stage is completed, pedestrian emergency services access (e.g. surf life savers) may access the pool. Traffic control would be required for pedestrian access past the works site, and therefore access may be subject to a short wait if construction is in progress, subject to Contractor. While access is constrained, the SLSC should be advised of the need to make alternative arrangements.

Emergency services vehicle access to the carpark from Pittwater Road will not be impacted. However, access from Birdwood Avenue may be impacted as it is proposed that the site compound uses the existing road access from Birdwood Avenue. Given the construction traffic and site compound are proposed to be located off Birdwood Avenue, it would be preferable for all emergency services vehicles to access the car park via Pittwater Road for the duration of construction.

6.2 Consideration of Matters of National Environmental Significance

Matters of National Environmental Significance must be considered under the environmental assessment provisions of the *EPBC Act*. No matters of National Environmental Significance would be impacted by the proposed works, as set out in **Table 6-2** below.

Table 6-2 Summary of matters of National Environmental Significance relevant to the proposed works

Matters of National Environmental Significance	Impact	Section in this REF
a. Any environmental impact on a world heritage property?	Nil	4.10
b. Any Environmental Impact on a National Heritage place?	Nil	4.10
c. Any Environmental Impact on Ramsar Wetlands of international importance?	Nil	4.6
d. Any environmental impact on Commonwealth listed threatened species and ecological communities?	Nil	4.6
e. Any environmental impact on Commonwealth listed migratory species?	Nil	4.6
f. Does any part of the project involve a nuclear action?	Nil	1.5
g. Any environmental impact on the Commonwealth marine environment?	Nil	4.6
h. Any impact on Commonwealth land?	Nil	2.2

7 Conclusion

This REF is a written statement prepared for Northern Beach Council that considers the impact of the proposed Stage 1 (Option D) stormwater and seawall upgrade works on the natural and built environment, and the proposed methods of mitigating or ameliorating any adverse effects. This REF has been prepared in order to address the requirements of Section 5.5(1) and section 5.7(1) of the Environmental Planning and Assessment Act 1979 and clause 171(2) of the Environmental Planning and Assessment Regulation 2021.

It can be confirmed that:

- the objects of the EP&A Act relating to the protection and enhancement of the environment have been considered in the preparation of the REF;
- all matters affecting or likely to affect the environment by reason of the works have been examined and taken into account to the fullest extent possible;
- the works are not considered likely to significantly impact the environment and an EIS is therefore not considered to be necessary; and
- in reaching the conclusions above, the factors listed in clause 171(2) of the EP&A Regulations have been taken into account.

Key conclusions from this REF are summarised as follows:

- The activity is permissible pursuant to Part 5 of the Environmental Planning and Assessment Act, through the provisions in Clause 2.137 of SEPP (Transport and Infrastructure) 2021 which states that “Development for the purpose of stormwater management systems may be carried out by or on behalf of a public authority without consent on any land”.

- Overall, works will have a positive impact on the environment and community by renewal of existing infrastructure, reduction of flooding on upstream of the stormwater network and protection of existing amenities and services.

- Potential environmental impacts primarily relate to water quality, groundwater management, waste management and disposal, heritage, biodiversity, and noise and vibration, and have been addressed by this REF.

- Part of the works area adjoining the rock pool overlaps the Long Reef Aquatic Reserve, regulated under Clause 56 the *MEM Act*. Based on requirements stipulated in the *MEM Act*, if Council is of the opinion that the proposed activity is likely to have an effect on the plants or animals within the aquatic reserve or their habitat (including soil, sand, shells or other natural materials) and/or any other assessment criteria identified in the act, they must consult with the relevant authority (DPI). If deemed necessary by the Council and DPI following consultation, a permit to harm animals or plants, damage, take or interfere with habitat, or conduct an activity that is prohibited under the *Marine Estate Management Regulation 2017* may be required. This permit application can be jointly completed with the Fisheries permit under Part 7, Section 200 of the *FM Act*.

- The following permit(s) will be required as part of the proposed works:
    - A Fisheries permit under Part 7, Section 200 of the *FM Act* is required for dredging/reclamation due to disturbance of the seabed as part of the outfall demolition, seawall reconstruction and outfall works.

- Based on the fact that the proposed works would likely exceed 3ML of extraction, particularly during rainfall events, it is expected that an exemption for licencing would not be granted by Water NSW and a Water Access License would be required.

8 Certification

This Review of Environmental Factors (REF) provides a true and fair review of the Proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the Proposal.

Name:	Ali Watters
Position:	Principal Environmental Engineer
Company name:	Haskoning Australia
Date:	In progress

I certify that I have reviewed and endorsed the contents of this REF document and, to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under clause 170 of the EP&A Regulation, and the information it contains is neither false nor misleading.

Name: Yianni Mentis
Position: Executive Manager Environment and Climate Change NBC
Council name: Northern Beaches Council
Date: 20/05/2024

9 References

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Appendix A – 20% Detailed Design Drawings

Appendix B – Sand Blockage Assessment

Appendix C – Wave Climate and Scour Assessment