Review of Environmental Factors

Tennyson Street Extension

Prepared for Byron Shire Council
By Planit Consulting Pty Ltd

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Executive Summary

This Review of Environmental Factors (REF) has been prepared to consider potential environmental effects for the proposed extension of Tennyson Street (road works) to be undertaken by Byron Shire Council (BSC). The proposed road works are located within Byron Bay within the BSC Local Government Area.

The proposed road works relate to an extension of Tennyson Street and addition tie in works within the road reserve of Tennyson Street.

The Tennyson Street extension is the subject of this REF and involves the full extension of Gilmore Crescent through to Tennyson Street including provision of additional parking, shared pathway, pathway linkage to the Jarjumirr Skate Park, drainage adjustments and roadside infrastructure.

The activity is being undertaken by BSC at the request of NSW Government, Department of Planning and Environment - Crown Lands (DPE-CL) to service Crown Reserve R755695 being former Lot 457 in DP1087879.

Development consent is not required for the proposed road works in accordance with Division 17 (roads and traffic) and clause 2.108 and 2.109 of State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&ISEPP).

The activity will also include ancillary construction of new drainage culverts running under the road extension including replacement of the existing 750RCP pipe and construction of a 4x cell culvert and headwall that will link into BSC drainage works proposed in the future under a separate scope of works. The works are ancillary to the road extension works, however these works are also permitted without consent in accordance with Division 20 Stormwater Management Systems, Clause 2.137 (1) of T&ISEPP.

The Proposal becomes an 'activity' for the purposes of Part 5 of the EP&A Act.

This environmental assessment has been prepared in accordance with Clause 171 of the *Environmental Planning and Assessment Regulation 2021* (the Regulations) and indicates that the activity is not likely to present significant risk to environmental, cultural, and human values.

During the construction phase potential short term impacts will occur affecting local traffic and the local noise environment. Appropriate traffic management control will ensure minimal disruption to traffic movements and noise impacts will be managed through ongoing consultation with affected landowners.

The design alignment has been selected to minimise impacts on biodiversity. Compensatory plantings are proposed to be undertake by BSC to offset the loss of habitat. To mitigate the vegetation clearing associated with the proposed development and achieve no net loss of biodiversity, compensatory planting is recommended generally in accordance with the Byron Shire Development Control Plan 2014 Chapter B1 Biodiversity. Suitable location for the compensatory plantings occurs throughout the locality (location to be chosen by Council). Plantings may also occur as a part of landscaping works post-construction within the broader Sandhills Estate Precinct.

As the activity occurs on Crown Land and the general area associated with the Sandhills Estate is a place of significance for the Bundjalung of Byron Bay Aboriginal Corporation (Arakwal) people, BSC has undertaken a site inspection and consultation with Arakwal and Tweed Byron Local Aboriginal Land Council (TBLALC) regarding the activity.

State Emergency Services (SES) have been consulted in accordance with Clause 2.13 of T&ISEPP, due to the activity involving road and road infrastructure facilities proposed on flood prone land.

The following consultation and notification are proposed for the activity:

- Timely with TBLALC and Arakwal prior to commencing works
- Notification of any receivers within 100 m of the works (letterbox drop or equivalent) is recommended providing information about the project including the anticipated duration of such works at least two weeks prior to undertaking the works. All notified receivers will be

provided with a contact telephone number for any complaints/ updates associated with the proposed works.

- Adjacent receivers with potential to experience impacts associated with dust and other airborne particles due to works are to be notified of any potential air quality impacts prior to undertaking the works.
- Any traffic delay notifications will be issued by Council at least two weeks prior to commencement of works. Notification will be made via Council website and potable variable messages sign (VMS) located along the affected public road.

A Construction Environmental Management Plan (CEMP) is to be prepared prior to any construction works commencing. The CEMP is to include the mitigation measures listed with this REF including preparation of the following supporting plans:

- Unexpected finds protocols and waste handling procedures for managing potentially contaminated soils;
- A Dewatering Management Plan is recommended for the activity to address excavations that will encounter possible inflows/groundwater during construction;
- An acid sulfate soils management plan is required for the works in accordance with the Acid Sulfate Soils Manual; and
- Where works occur next to live traffic a Traffic Control Plan (TCP) shall be prepared by a qualified person and implemented for the works in accordance with the requirements of SafeWork NSW.

Overall, no significant environmental impacts are likely to occur and a variety of safeguards have been developed to avoid and/ or minimise potential negative impacts. Together with the mitigation methods identified in this report, these safeguards will ensure appropriate environmental outcomes are achieved when undertaking the proposed activity.

1 Introduction

This Review of Environmental Factors (REF) has been prepared by Planit Consulting Pty Ltd on behalf of BSC to consider potential environmental effects of the proposed road works.

This REF has been prepared to assess the full extension of Tennyson Street through to Gilmore Crescent including provision of additional parking, drainage adjustments, shared pathway and roadside infrastructure. The activity will also require ancillary services adjustments and vegetation clearing.

The environmental assessment and determination of the proposal has been undertaken in accordance with Part 5 of the EP&A Act. For this proposal, BSC is both a public authority proponent (EP&A Act s5.3) and the determining authority (EP&A Act s. 5.1). The REF has been prepared in accordance with Clause 171 of the Regulations and the *Guidelines for Division 5.1 Assessments* (Department of Planning and Environment, June 2022).

Documentation supporting this REF includes:

- Appendix A - Concept Design
- Appendix B - Biodiversity Assessment Reports
- Appendix C – Environmental Searches
- Appendix D – Radiation Survey
- Appendix E – ENM Report
- Appendix F – Aboriginal Cultural Heritage
- Appendix G – NSW SES Response
- Appendix H - Byron Shire Council's Unexpected Finds and Stop Work Protocols

1.1 Project Location and Context

The activity is located in the suburb of Byron Bay, situated on the Far North Coast of NSW within the BSC Local Government Area.

The proposed road works relate to an extension of Tennyson Street and some addition tie in works within the road reserve of Tennyson Street.

Residential properties, tourist accommodation, the Sandhills Early Childhood Centre and Byron Youth Centre (YAC) adjoin the works areas.

Based on the location of the activity and review of online environmental and planning databases, we note that:

- The activity is located across land mapped as Tyagarah soil landscape, consisting of sediment of mixed estuarine and aeolian origin. The limitations of the soil type are very strongly acid, permeable, often waterlogged soils of low fertility and low water holding capacity with localised salinity, permanently high water tables and moderate wind erosion hazard.
- The activity area is mapped as containing acid sulfate soils (ASS) class 3. Soil testing for the activity has identified that ASS is present within the activity area from a depth of 1.0 m to 2.5 m below surface level.
- Radiation and land contamination assessment was undertaken for the broader Sandhills Estate Activation project (refer to Appendix D) identifying that radiation levels within the activity area range between 0.08 to 0.36 uSv.hr1 at 1 metre above ground level; identifying that radiation levels comply with the applicable health guidelines and that the site is suitable for proposed uses including roads and paths. Radioactive heavy mineral sands residues (HMSRs) may be present in material excavated to enable construction.
- The activity area includes the following native vegetation/habitat as follows:

  - 12 native trees >3 m in height for the proposed pathway and 15 native trees >3 m in height in the lighting services alignment. These trees occur scattered within a highly disturbed existing informal walking corridor.
  - One threatened flora species occurs within the project footprint (Stinking Laurel Cryptocarya foetida); two trees occur within close to the southern trenching location but will be retained; one tree will require minor pruning.
  - Approximately 2320 m² of disturbed Swamp Oak Forest (PCT 4034), a TEC.
  - Nine Stinking Laurel in the location of the proposed roadworks.
- Vegetation located within the Sandhills Estate adjacent to the Jarjumirr Skate Park and Library is mapped as biodiversity value land (BVL) under the *Biodiversity Conservation Act 2016* (80m northwest of the activity). This area of vegetation is also mapped Coastal Wetland under the SEPP (Resilience and Hazards) 2021. (RHSEPP).
- The activity area does not include Coastal Wetland or Littoral Rainforest mapped under RHSEPP.
- The site is not mapped key fish habitat under the provisions of the Fisheries Management Act 1994 and there are no mapped drained lines or waterways within the site.
- Indigenous Land Use Agreement (ILUA) NI2006/004 applies to the land, under which native title rights and interest have been surrendered. Council has satisfied itself that no action is required under the *Native Title Act 1993*.
- The activity area is not listed as a heritage conservation item or conservation area under NSW or Commonwealth legislation.
- The activity area is mapped as flood prone land.
- A constructed drainage channel and culvert runs perpendicular to the new road alignment and crosses the activity area approximately 18m north of the current road reserve of Tennyson Street.
- The activity area has a low point of RL 3.0m at the Tennyson end of the activity area.
- The are 'sensitive receivers' within proximity of the works area (i.e. residents who could be disturbed by construction noise).
- Site access to the activity is gained from Gilmore Crecent (north) and Tennyson Street (south).

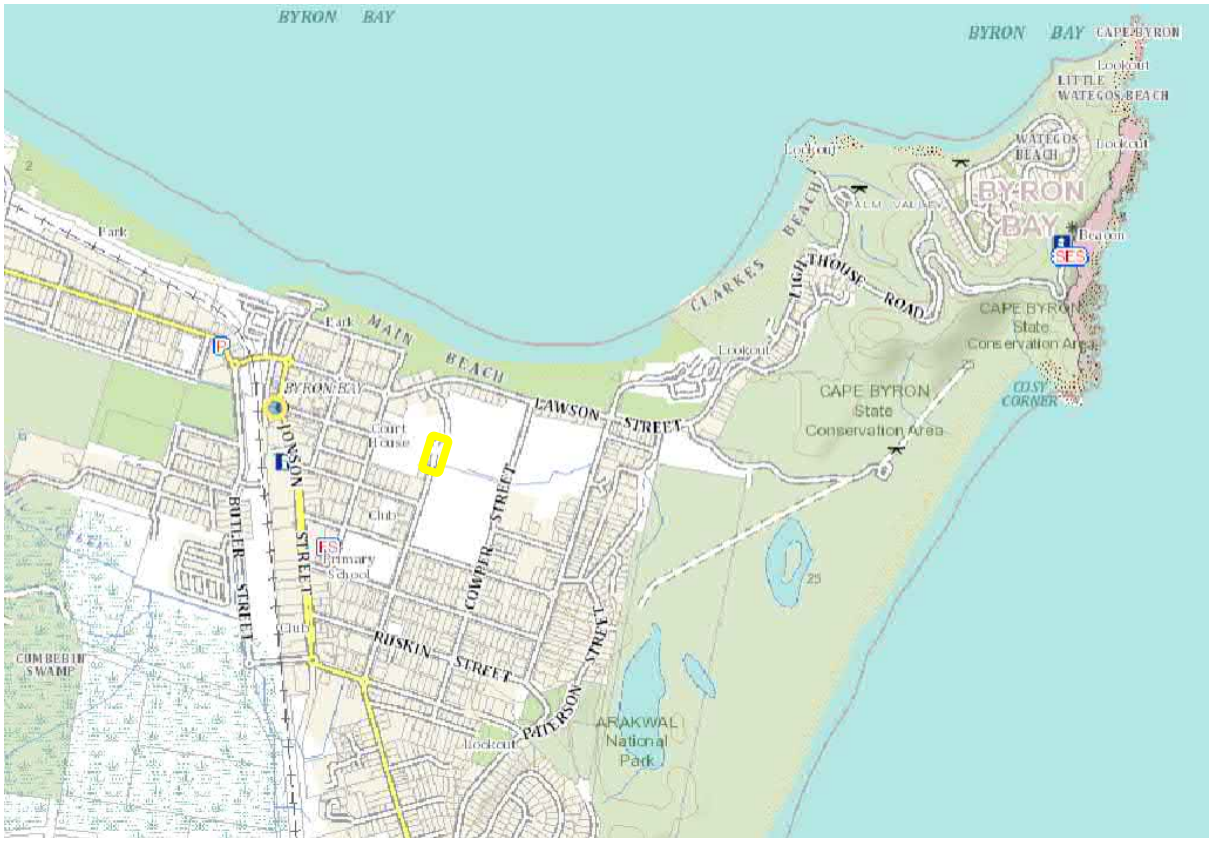

Figure 1.1 | Locality plan (approx. activity area yellow boundary)

Source: NSW ePlanning Spatial Viewer

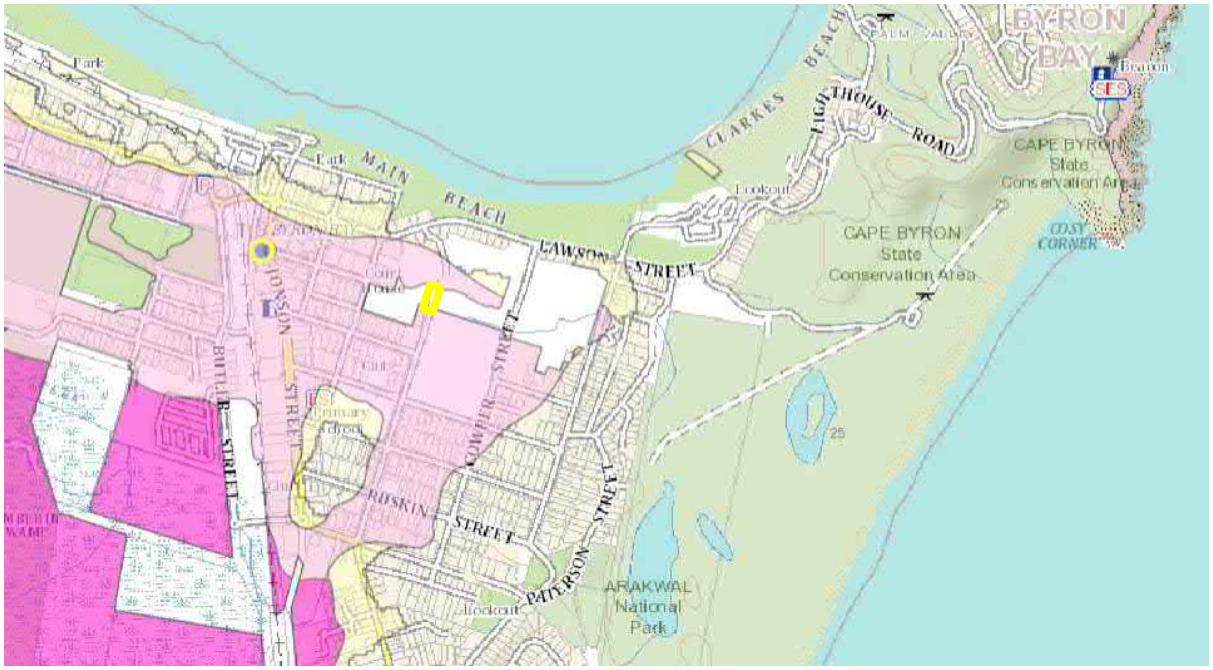

Figure 1.2 | ASS mapping (approx. activity area yellow boundary)

Source ePlanning Spatial Viewer

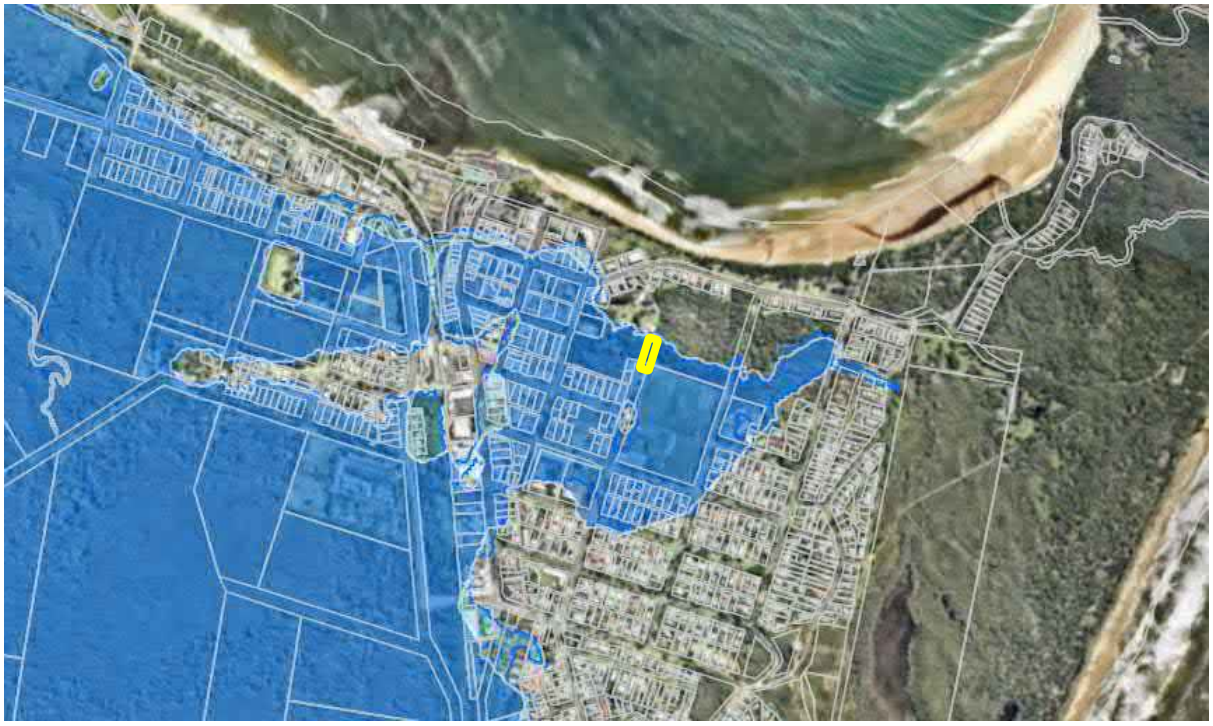

Figure 1.3 | Flood mapping (approx. activity area yellow boundary)

Source: BSC Online Mapping

Figure 1.4 | BVL mapping (approx. activity area yellow boundary)

Source ePlanning Spatial Viewer

Figure 1.5 | PCT Vegetation mapping (approx. activity area yellow boundary)

Source: NSW SEED Mapping

1.2 Project Need, Objectives and Options

The activity is being undertaken by BSC at the request of NSW Government, Department of Planning and Environment - Crown Lands (DPE-CL).

The road works are proposed to establish suitable vehicle access, parking, lighting and roadside pedestrian linkages.

The secondary objective of the activity is to:

- Discourage anti-social behaviour in and around Crown Reserve R755695;
- Provide accessible pedestrian and cycle linkages to and through Byron Bay;
- Accommodate and improve stormwater management as part of the Byron Bay Drainage Upgrade; and
- Minimise any environmental impacts associated with the construction and operation of the activity.

1.3 Design Refinements

Minor design refinements are likely to occur during detailed design of the activity. Any required design refinements may proceed without further REF approvals providing:

- The design changes are generally within the same alignment of the activity or adjoin the activity area alignment.
- The design refinements relate to the development form generally outlined in section 2 of this REF; and
- The design refinements do not result in any additional clearing of native vegetation or threatened species.

2 Proposed Activity

2.1 Scope of Works

The extent of the activity includes approximately 280 m of works including:

- Tennyson Street works:
  - Extension of the road formation with asphalt seal through to Tennyson Street from Gilmore Crescent;
  - Provision of 90^0 angle parking on either side the new Gilmore Crescent road formation;
  - Provision of 1.5m pedestrian pathway on the western side of Gilmore Crescent creating links between the YAC , the Sandhills Early Childhood Centre, the Jarjumirr Skate Park and new parking areas located on the western side of Gilmore Crescent;
  - Provision of 2.0m gravel pathway with concrete edge on the western side of the new road running south of the YAC linking into the existing 1.5 m pedestrian pathway located at the Jarjumirr Skate Park;
  - Services adjustment including drainage, power and lighting compliant with AS4282:2019 Obtrusive Effects of Outdoor Lighting.
- Tennyson Street works including:
  - Provision of a 2.5 m shared path linking into the new shared path located on the eastern side of the Gilmore Crescent extension; and
  - Provision of 90^0 angle parking on the eastern side of Tennyson Street.

An overview of the scope of works required for the activity is presented at Table 2.1**.**

Table 2.1 Scope of Works

Stage	Details / Requirements
Preconstruction	• Completion of Detailed Construction Plans • Preparation of Construction Environmental Management Plan (CEMP), incorporating recommendations from this REF • Survey works alignments and mark out construction area • Mark out vegetation clearing areas • Install traffic management controls along affected section of the public road • Install sediment and erosion controls • Establish temporary fencing and exclusions zone fencing • Establishment of ancillary site compounds and stockpile areas • Consultation with adjoining and affected landowners • Timely provided to TBLALC and Arakwal prior to commencing works.
Construction	• Construction staff toolbox training regarding works scope and environmental constraints • Cultural heritage monitoring during ground excavation • Updating affected adjoining landholders on the status of the works and potential impacts

Stage	Details / Requirements
	• Vegetation clearing • Services assessment • Maintain access to adjoining properties during construction • Construction of road and road infrastructure facilities between Gilmore Crescent and Tennyson Street. • Services adjustments including drainage, power and lighting compliant with AS4282:2019 Obtrusive Effects of Outdoor Lighting • Classify waste materials and disposal of waste materials at licensed waste facility • ASS management and dewatering. • Use of temporary site compound in and adjacent to the activity area including the public road reserve and Council land
Disestablishment, Clean up and Offset Planting	• Reinstate road pavements and utilities as required upon completion of works. • Replace topsoil to stabilise land surfaces that have been impacted as a result of the construction phase • Provide grass to all disturbed areas post earthworks as soon as possible • Remove traffic management controls • Site clean-up • Undertake offsetting plantings to compensate for loss of native vegetation in accordance with broader VMP for the Sandhills Estate Activation project.

2.2 Machinery and Equipment

Works will be undertaken using machinery and equipment such as:

- Tip Trucks
- 20 to 30 tonne excavators
- Graders and Rollers
- Profilers
- Vibratory rollers
- Water carts
- Hydraulic hammers and concrete saws
- Concrete mixing trucks
- Track loader/Bobcat
- Chainsaws, mechanical mulchers
- Backhoe
- Concrete trucks and concrete pumps
- Compaction equipment
- Asphalt trucks and bitumen sprayers

- Traffic control equipment (automated and manned), incl. signage, barriers, bollards)

2.3 Work Methodology

Construction activities will be guided by a Construction Environmental Management Plan (CEMP) to ensure work is carried out to specifications within the activity area. Detailed work methodologies will be identified by the construction contractor. The staging of construction will be sequenced to complete construction within the minimum possible timeframe.

The construction period for the activity is expected to take approximately four months pending weather conditions.

Construction working hours will be limited to the following:

- 7 am to 6 pm Monday to Friday;
- 8 am to 1 pm Saturdays; and
- No works will be undertaken on Sundays or Public Holidays.

Works may be undertaken outside these hours where:

- The delivery of materials is required outside these hours;
- It is required in an emergency to avoid the risks to public safety, damage to property and/or to prevent environmental harm;
- Receivers likely to be affected by the works are notified in writing of the timing and duration of these works at least 24 hours prior to the commencement of works (except for emergency work).

2.4 Ancillary Facilities

The proposed activity will require a temporary site compound within and adjacent to the activity area including the public road reserve and Council Land to support construction of the road and road infrastructure facilities and will include staff amenities, stockpile areas, laydown areas and staff parking.

Exclusion fencing may also be required to secure the works areas and ensure safety of the public.

2.5 Traffic Management

The construction of the activity will require works within the road reserve requiring traffic control to be implemented. Where works occur next to live traffic a Traffic Control Plan (TCP) shall be prepared by a qualified person and implemented for the works in accordance with the requirements of SafeWork NSW. Licensed traffic controllers will assist with traffic control during the Project.

Traffic delay notifications will be issued by BSC at least two weeks prior to commencement of works. Notification will be made via BSC website and potable variable messages sign (VMS) located along the applicable public road network.

2.6 Tree Protection

Retained native vegetation (individual trees and copses of vegetation) proximate to works which are not subject for removal are to be clearly fenced and managed during construction activities in accordance with the Australian Standard 'AS 4970 Protection of Trees on Development Sites'.

2.7 Vegetation Removal and Biodiversity Offsets

Biodiversity Assessment prepared for the activity (refer to Appendix B) has identified that the following vegetation will require removal:

- 12 native trees >3 m in height for the proposed pathway. These trees occur scattered within a highly disturbed existing informal walking corridor;
- Approximately 2320 m² of disturbed Swamp Oak forest (PCT 4034), a TEC ; and
- Nine Stinking Laurel for the proposed roadworks

Additional clearing is also required for lighting installation and underground conduit for the road extension including:

- Loss of 15 native trees >3 m height at scattered locations:
  - 2 x Broad-leaved Paperbark
  - 1 x Coast Banksia
  - 11 x Swamp Oak
  - 1 x Broad-leaved Paperbark
- Pruning of three planted native trees – one Weeping Lilly Pilly at Sandhills daycare centre; 2 x Blue Lilly Pilly on the western road verge
- Pruning of 1 threatened flora - Stinking Laurel (Cryptocarya foetida).
- Landscaping impacts:
  - Loss of a small (2m) planted Lemon Myrtle (Backhousia citriodora) in the skatepark
  - Root zone impacts to a Golden Penda*(Xanthostemon chrysanthus) outside the daycare centre
  - Pruning of a Mango tree on the western road verge

To mitigate the vegetation clearing associated with the proposed development and achieve no net loss of biodiversity, compensatory planting is recommended generally in accordance with the Byron Shire Development Control Plan 2014 Chapter B1 Biodiversity. Suitable location for the compensatory plantings occurs throughout the locality (location to be chosen by Council). Plantings may also occur as a part of landscaping works post-construction within the broader Sandhills Estate Precinct.

2.8 Pre-Clearing inspections

Construction staff will delineate the clearing footprint prior to undertaking clearing works. Within the designated clearance zone identification of areas to be cleared are to be pre-assessed by an experienced wildlife spotter/catcher. This pre-assessment shall allow for an inventory of trees bearing birds nests and/or hollows to be undertaken prior to felling works (note- none identified within the alignment during ecological assessment). A wildlife spotter catcher is to be utilized during clearing of the site to ensure safe dispersal and relocation of any encountered native fauna within the residential property.

2.9 Services adjustments

The activity has been designed to minimise impacts on adjoining services and detailed services locations will be undertaken prior to construction to ensure underground utilities are not damaged during construction. Power services may be adjusted to enable new lighting to be installed within the street and shared pathway alignment. The new lighting will be compliant with AS4282:2019 Obtrusive Effects of Outdoor Lighting to mitigate impact on adjoining bushland and properties, whilst also providing some passive surveillance at night.

Roadside drainage will also be constructed to mitigate and direct surface flow from the road to the public drainage system. New drainage systems will be constructed under the road extension to accommodate drainage flow under the road.

3 Existing Environment and Impact Assessment

3.1 Landform, Geology and Soils

3.1.1 Existing Environment

Review of eSPADE online mapping identifies that the soil landscape of the activity area is Tyagarah soil landscape, consisting of sediment basins of mixed estuarine and aeolian origin. The limitations of the soil type are very strongly acid, permeable, often waterlogged soils of low fertility and low water holding capacity with localised salinity, permanently high water tables and moderate wind erosion hazard.

Topographic levels vary across the activity area, with a range of approximately 4.25m AHD at the northern extent of the activity area and 3.00m AHD at the existing stormwater line that traverses the southern extent of the activity near the tie in point at Tennyson Street.

3.1.2 Impact Assessment

Earthworks associated with the activity includes excavations to enable:

- Tree removal;
- Services adjustments; and
- Site leveling and earthworks.

Soil disturbance from the activity has potential to disperse into drainage lines within the Sandhills Estate if sediment controls are not implemented during excavations.

The implementation of the recommended safeguards tabled below will ensure any adverse impact on soils and landform will be restricted to the minimal possible extent.

Does the activity involve the disturbance of large areas (e.g. >2ha) for earthworks?	Yes	☐	No	☒
Does the site have constraints for erosion and sedimentation controls such as steep gradients or narrow corridors?	Yes	☐	No	☒
Is the activity footprint in or nearby a highly sloping landform?	Yes	☐	No	☒
Are there any sensitive receiving environments that are in or nearby the likely activity footprint or that will likely receive stormwater discharge from the activity?	Yes	☒	No	☐

Landform, Geology and Soils - Recommended Safeguards:

- *Site management will incorporate best management erosion and sediment control practices such as those found in the Department of Housing's "Blue Book (4th Edition) on erosion and sediment control and Safe Work Australia 'Excavation Code of Practice (March 2015).*
- *Non-ASS excavated material should be temporarily placed in the form of a bund upslope of the site where necessary to reduce surface water entering the construction areas.*
- *All erosion and sediment control devices will be visually inspected weekly and before forecast rain events to ensure effectiveness as well as after each rainfall event.*
- *Wash down, if undertaken at the site, must be undertaken in a designated and controlled (bunded and plastic lined) area within the site. Wash down shall use potable water and excess debris removed using hand tools. Wash down waste must be filtered before release.*

- *Excavated areas will be stabilised and covered as soon as possible including the use of mulch generated from the activity.*

3.2 Contaminated Land and Acid Sulfate Soils

3.2.1 Existing Environment

Review of BSC online mapping identifies that there are no cattle dip sites or registered contaminated land within the activity alignment. The EPA contaminated lands register identifies no registered contamination sites within the activity area (refer to Appendix C). The nearest registered cattle dip site (Andersons) is located at Belongil Beach within SP85426, approximately 1.7km west of the site.

Radiation and land contamination assessment was undertaken for the broader Sandhills Estate Activation project (refer to Appendix D) identifying that radiation levels within the activity area range between 0.08 to 0.36 uSv.hr[1] at 1 metre above ground level; identifying that radiation levels comply with the applicable health guidelines and that the site is suitable for proposed uses including roads and paths. Radioactive heavy mineral sands residues (HMSRs) may be present in material excavated to enable construction.

The ePlanning Spatial Viewer identifies that the activity area is mapped as being prone to acid sulfate soils Class 3. A ENM Validation Report prepared for the activity identifies that excavations required for the activity will encounter acid sulfate soil has identified that ASS is present within the activity area from a depth of 1.0 m to 2.5 m below surface level (refer to Appendix E).

3.2.2 Impact Assessment

As detailed above, the activity area does not indicate any risks associated with contaminated land. Therefore, material excavated onsite does not present any constraints relating to land contamination.

Considering the existing environment, exposure of contaminated soils is low. Any potential that contamination may be present, would be associated with possible illegal dumping. If contaminated soils are to be present on site, the possibility of exposing and dispersing these soils could be a result of excavation activities and earthworks. As outlined above, radiation and land contamination assessment undertake for the broader Sandhills Estate Activation project (refer to Appendix D) demonstrating that radiation levels comply with the applicable health guidelines and that the site is suitable for proposed uses including roads and paths.

The works are located in area mapped acid sulfate soils (Class 3). Excavations required for the activity will encounter ASS at a depth of 1.0 m to 2.5 m below surface level.

When exposed to air, the iron sulfides in ASS react with oxygen to create sulfuric acid. The acid makes metals in the soil, such as iron and aluminium, more soluble. These metals can be released in toxic amounts.

The acid and released metals can have many damaging effects including:

- Damaging waterways and killing aquatic life: Rainfall can wash acid and toxic metals into waterways, killing organisms that are immobile (such as oysters) or that live in sediment. It can also reduce survival and growth rates of plants and animals and promote outbreaks of disease (especially red-spot disease in fish).
- Killing plants: Very acidic soil can kill all plants growing in it.
- Corrosion: Sulfuric acid can corrode concrete, iron, steel and some aluminium alloys.
- Toxic water and dust: Acid sulfate soil and water can irritate skin and eyes. Drinking acidic water may make animals ill.

To mitigate risk to the environment, including adjoining biodiversity areas within the Sandhills Estate and nearby residential areas, an Acid Sulfate Soils Management Plan, prepared in accordance with the Acid Sulfate Soils Manual, will be required for excavation works and movement of spoil generated by the works.

Spoil material will be generated from the works and this material is likely to contain HMSRs. As a precautionary measure spoil generated from the works will be tested and managed accordingly in regard to any potentially elevated gamma radiation levels. This will require the preparation of a project specific HMSR Management Plan.

During construction there is potential for chemical spills to occur from plant and equipment used during construction (e.g. petrol, lubricants). Chemicals have potential to move into drainage lines and into soil profiles. Spill kits and construction staff training are required to minimise chemical spill impacts during construction.

The safeguards tabled below are recommended to prevent any adverse impacts on the surrounding environment.

Is there any evidence within or nearby the likely footprint of potential contamination?	Yes	☐	No	☒
Are there any known occurrences of salinity or acid sulfate soils in the area?	Yes	☒	No	☐

Contaminated Land and Acid Sulfate Soils - Recommended Safeguards:

- *Spill kits maintained onsite during the construction period and employees trained how to use spill kits.*
- *CEMP is to contain suitable unexpected finds protocols and waste handling procedures for managing potentially contaminated soils. This should include, as a minimum:*
    - *Works to proceed with caution and cease immediately if any potential source of contamination are encountered during development, then works should be halted until confirmation of the presence of contamination is undertaken. In instances where contamination is confirmed, remediation in accordance with an approved Remediation Action Plan will be required.*
    - *Any excess spoil to be disposed offsite from the proposed works will need to be classified pursuant to the EPA Waste Classification Guidelines. Relevant permits may need to be obtained for such waste in accordance with the POEO Act 1997 and the relevant guidelines.*
- *A project specific HMSR Management Plan shall be prepared and will include a description of the contamination and the activities to be conducted to further define the HMSRs as part of the works, management options proposed regarding stockpiling, testing, reuse and/or disposal of HMSR material to be conducted, along with relevant waste tracking and disposal options.*
- *Stockpiling of material is permitted at an existing BSC approved temporary stockpile location and is required to be consistent with the project specific HMSR Management Plan prepared for the activity.*
- *An Acid Sulfate Soils Management Plan shall be prepared for the works in accordance with the Acid Sulfate Soils Manual. The location of any areas for treatment and stockpiling of excavated ASS materials shall be approved in writing by Council following Council review of the Acid Sulfate Soils Management Plan..*

3.3 Water Quality and Hydrology

3.3.1 Existing Environment

The site is not mapped key fish habitat under the provisions of the *Fisheries Management Act 1994*.

The activity area does not include Coastal Wetland mapped under RHSEPP.

The activity area is identified as flood prone land under BSC flood planning framework.

A constructed drainage channel and culvert runs perpendicular to the new road alignment and crosses the activity area approximately 18m north of the current road reserve of Tennyson Street.

The activity area has a low point of RL 3.0m at the Tennyson end of the activity area.

3.3.2 Impact Assessment

Construction activities have potential to impact the pH, electrical conductivity, turbidity, dissolved oxygen and temperature of receiving water environments. Variations in water quality can negatively impact aquatic environments resulting in fish disease, kills, loss of food resource, reduced fish migration and recruitment potential and disturbance to water plant communities.

The site does not feature any significant waterways and is not located directly adjacent to any significant natural water environments.

A constructed drainage channel and culvert runs perpendicular to the new road alignment and crosses the activity area approximately 18m north of the current road reserve of Tennyson Street. Best practice erosion and sediment controls will be established and implemented during construction to ensure sediment laden runoff does not enter the drain.

The activity will also include new drainage culverts running under the road extension including replacement of the existing 750RCP pipe and construction of a 4x cell culvert and headwall that will link into BSC drainage works proposed in the future under a separate scope of works.

It is noted that the Sandhills Estate area (Lot 12 DP1306781) east of the site forms part of a Council-initiated wetland project. The extent of excavation proposed during construction is considered minor and with implementation of the environmental safeguards presented in this REF, does not present a significant risk to water quality within the adjoining Sandhills Estate.

The proposed activity area is mapped as flood prone land. The works are not considered to create a new barrier for floodwaters nor are they likely to change the flood patterns of the locality. The new road levels do not create any additional barriers to the movement of surface waters during wet weather events. The proposed drainage works at the Tennyson Street end of the works will maintain movement of surface flows across the alignment.

The activity area has a low point of RL 3.0m at the Tennyson Street end of the activity area. Excavations required to install the drainage design will require construction dewatering, particularly in the event of heavy rainfall and surface water inflow into excavation areas. Therefore, a construction Dewatering Management Plan is required to support the construction phase of the project.

Construction dewatering taking over 3 megalitres of groundwater through an aquifer interference activity per authorised project per water year requires a water access licence under Section 92 of the Water Management Act 2000.

It is noted that works scheduling could be impacted by significant rainfall events including flooding and waterlogging that could restrict vehicles and equipment access.

Post construction the works areas will be stabilised with groundcover to ensure overland movement of sediment is minimised.

The implementation of the recommended safeguards tabled below will ensure any adverse impact on water quality and hydrology will be restricted to the minimal possible extent.

Are the works located within, adjacent to or near a waterway or body of water?	Yes	☐	No	☒
Is the location known to flood or be prone to water logging?	Yes	☒	No	☐
Will the proposed works be undertaken on a bridge?	Yes	☐	No	☒
Are the works likely to require the extraction of water from a local water course?	Yes	☐	No	☒

Water Quality and Hydrology - Recommended Safeguards:

- *Machinery is appropriately cleaned, degreased and serviced prior to use at the site.*
- *Spill kits maintained onsite during the construction period and employees trained how to use spill kits.*
- *Visual monitoring of local drainage systems within the site is to be undertaken during rainfall events to identify any potential spills or deficient controls.*
- *Contractors and BSC shall monitor weather forecasts daily and review construction activities to ensure that:*
    - *Works are scheduled and planned to consider significant rain/flood events; and*
    - *The works do not negatively impact emergency evacuation routes where possible.*
- *A project specific Dewatering Management Plan shall be prepared in accordance with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018).*
- *Construction dewatering taking over 3 megalitres of groundwater through an aquifer interference activity per authorised project per water year requires a water access licence under Section 92 of the Water Management Act 2000 prior to undertaking dewatering activities.*

3.4 Biodiversity

3.4.1 Existing Environment

The activity alignment includes an area of vegetation mapped as high environmental value under BSC online mapping including coastal dune dry sclerophyll forest and coastal swamp forest. Review of the Byron Shire Council online mapping also confirms the activity area does not include Koala Habitat mapped under the Byron Coast Comprehensive Koala Plan of Management. The activity area does not include land mapped biodiversity values under the BC Act.

Biodiversity Assessment (refer to Appendix B) prepared for the activity identifies that the activity area includes:

- The site comprises highly disturbed Swamp Oak forest (PCT 4034);
- PCT 4034 is characteristic of the threatened ecological community (TEC) 'Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions' as listed in the BC Act;
- Two threatened flora species were recorded (Stinking Laurel Cryptocarya foetida, Fine-leaved Tuckeroo Lepiderema pulchella). A small local population of Stinking Laurel (>20 stems) occurs within 250m of the study area. Some of these trees will require removal for the project;
- One threatened fauna species was recorded (a camp of Grey-headed Flying-foxes occurs nearby); the site provides potential opportunistic foraging habitat for several threatened fauna species;
- The activity area includes the following native vegetation/habitat as follows:
    - 12 native trees >3 m in height for the proposed pathway. These trees occur scattered within a highly disturbed existing informal walking corridor
    - Approximately 2320 m^2 of disturbed Swamp Oak forest (PCT 4034), a TEC
    - Nine Stinking Laurel in the location of the proposed roadworks

  Biodiversity assessment prepared for the activity also identified that:

- The site locality provides moderate quality habitat due to the mix of several well-developed and structurally diverse communities. While a range of relatively common bird species were opportunistically observed during field assessment, this represents a small snapshot of the greater numbers which may occur during seasonal and climatic variations. A range of

microbat species would be expected to use the site and surrounds as foraging habitat, including a number of threatened species;

- No hollow-bearing trees or Koala feed trees occur within the works footprint;
- At the time of inspection an active Brush Turkey mound occurs within the proposed road footprint and birds forage freely within the study area and surrounds;
- At the time of inspection several nests (with chicks) of White Ibis occur in a mature Swamp Oak within ~10m of the proposed walkway;
- The known flying-fox roost is located to the west adjacent to the Court House;
- Surveys for the Mitchells Rainforest Snail (MRS) did not detect the species. It is considered that site falls within the known range of the snail. Although the species is known to occur within the locality (i.e. Byron bypass, Cumbebin Swamp Reserve etc.), no snails (or shells) were encountered during site survey efforts which included spotlighting and ground searches. The works footprint does not contain appropriate ground level structures suitable for this species and is dominated by weeds for the most part. Palms and Figs were also scarce. An Expert Report for the Mitchell's Rainforest Snail was prepared by Dr Parkyn (2021) for the Skatepark project immediately west of the works footprint. Dr Parkyn did not find any Mitchell's Rainforest Snails during survey works. He concluded that the site is neither 'primary' nor 'secondary' habitat for the species. It is considered unlikely that the proposal will significantly impact this species;
- Eighty-five (85) species of birds, twenty-three (23) species of mammals, seven (7) species of reptiles and eight (8) species of amphibians have potential to be located within the broader area; and
- Six (6) threatened fauna species (Grey-headed Flying-fox, Little Bent-wing Bat, Large Bent-wing Bat, Southern Myotis, Wallum Froglet and Sooty Owl) scheduled under the BC Act were recorded within the overall Sandhills Precinct during the site surveys. While not recorded, it is considered likely that the Greater Broad-nosed Bat, Eastern Long-eared Bat and Koala may also occasionally utilise areas of the site.

3.4.2 Impact Assessment

Clearing of vegetation (both native and exotic) will be the major direct impact associated with the activity although this clearing will be restricted to largely modified and disturbed areas. Based on the construction footprint design files the activity will require the clearing of the following vegetation communities:

- 2320 m² of PCT 4034 (Swamp Oak Floodplain Forest TEC) will be removed;
- 12 native trees >3 m height will occur for construction of the access pathway including:
  - 9 x Swamp Oak (8 x semi-mature to mature trees; 1 x sapling)
  - 1 x Tuckeroo (immature tree of ~ 4 m height)
  - 1 x Sandpaper Fig (immature tree of ~ 5 m height)
  - 1 x Mock Olive (Immature tree of ~ 2.5 m height)
- Loss of nine Stinking Laurel.

Indirect (operational) impacts include:

- Potential for weed invasion following works; and
- Increased potential for roadkill due to new traffic flow that may affect species such as water dragons, other reptiles and frogs. As the road speed will be a low speed urban road (50 km/hr). the potential for impacting ground dwelling mammals (eg. bandicoots, macropods) is relatively low.

During detailed design phase requirement for additional clearing was identified to enable construction of street lighting and associated underground conduits. A biodiversity assessment was prepared to confirm the impact of the additional clearing on biodiversity and is also provided at Appendix B.

Impacts associated with the additional clearing identified to enable construction of street lighting and associated underground conduits includes:

- Loss of 15 native trees >3 m height at scattered locations:
  - 2 x Broad-leaved Paperbark
  - 1 x Coast Banksia
  - 11 x Swamp Oak
  - 1 x Broad-leaved Paperbark
- Pruning of three planted native trees – one Weeping Lilly Pilly at Sandhills daycare centre; 2 x Blue Lilly Pilly on the western road verge
- Pruning of 1 threatened flora - Stinking Laurel (Cryptocarya foetida).
- Landscaping impacts:
  - Loss of a small (2m) planted Lemon Myrtle (Backhousia citriodora) in the skatepark
  - Root zone impacts to a Golden Penda*(Xanthostemon chrysanthus) outside the daycare centre
  - Pruning of a Mango tree on the western road verge
- Short term noise and disturbance to local fauna from plant and personnel.
- Potential for introduction of weed propagules during construction.

The works will require adjustment of an existing stormwater culvert however the pipe is currently buried and does not present suitable habitat for microbats and other fauna species.

A minor loss of native foraging resources, potential refuge habitat and potential nesting/breeding sites will occur as the proposed works will be restricted to a relatively small footprint of predominantly modified areas of native vegetation and no hollow bearing trees will be removed. Given the abundance of similar habitat types occurring within the locality it is considered highly unlikely that the temporary disturbance of potential habitat will have a significant impact upon any local fauna.

Compensatory plantings are proposed to be undertake by BSC to offset the loss of habitat. To mitigate the vegetation clearing associated with the proposed development and achieve no net loss of biodiversity, compensatory planting is recommended generally in accordance with the Byron Shire Development Control Plan 2014 Chapter B1 Biodiversity. Suitable location for the compensatory plantings occurs throughout the locality (location to be chosen by Council). Plantings may also occur as a part of landscaping works post-construction within the broader Sandhills Estate Precinct.

The biodiversity assessments (refer to Appendix B) included a test of significance assessment under the BC Act. The 'Test of Significance' concluded that the impacts of the proposed development are unlikely to threaten the viability of any local populations of the nominated species/communities. A species impact statement is therefore not required.

The biodiversity assessments (refer to Appendix B) assessed impact of the activity against the *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act). Under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of national environmental significance (MNES) require approval from the Minister for the Environment. The assessment determined that impacts of the activity on MNES are not significant, and referral of the project is not required.

The implementation of the recommended safeguards tabled below will ensure any adverse impact on biodiversity will be restricted to the minimal possible extent.

Have relevant database searches been carried out?	Yes ☒ No ☐

Did the database searches identify any endangered ecological communities, threatened flora and/or threatened or protected fauna within the vicinity of the proposed works?	Yes	☒	No	☐
Will the proposed works require the removal of any vegetation?	Yes	☒	No	☐
Will the proposed works affect any tree hollows or hollow logs?	Yes	☐	No	☒
Are there any known areas of critical habitat, coastal wetland or littoral rainforest area within the vicinity of the proposed works?	Yes	☒	No	☐
Will the proposed works provide any additional barriers to the movement of wildlife?	Yes	☐	No	☒
Will the proposed works disturb any natural waterways or aquatic habitat?	Yes	☐	No	☒
Will the proposed works disturb any crevices or other locations (such as on bridges and culverts) for potential bat habitat?	Yes	☐	No	☒
Will there be impact on any vegetation or land that is part of an offset or is protected under a condition of approval from a previous project?	Yes	☐	No	☒

Biodiversity - Recommended Safeguards:

- *Minimise the extent of clearing wherever possible.*
- *Prior to works the limits of clearing must be clearly defined by bunting or temporary fencing and these areas designated as 'no go' zones.*
- *A pre-clearing survey must be completed by an ecologist or spotter-catcher prior to vegetation clearance in the event that fauna are present. Surveys may be required over several days depending on the project timing and program. The project ecologist shall advise the project superintendent on any measures taken to avoid any fauna features or on measures necessary to avoid any active nests/dreys or other features. Consideration of avoiding impacting the brush turkey mound will be necessary with regarding to breeding times and the project timeline.*
- *Branches and woody debris within the clearing footprint shall be removed and relocated into adjacent vegetation/habitat) as part of the pre-clearing survey.*
- *For all tree removal completed, material shall be chipped and mulch used in landscaping or sprayed into adjacent vegetation (or removed from site as last resort if necessary).*
- *Weed hygiene measures must be practiced for the duration of the project to ensure propagules are not spread during clearing works.*
- *Any post-works landscaping must utilise endemic species reflective of the vegetation community present. It is recommended that landscape plantings include Stinking Laurel as a feature species and plants are sourced locally or established from seed collected and grown up from trees in the locality.*
- *A (temporary) fauna crossing sign should be installed for at least 12 months once the road is opened. The signs should be installed on either side of the new road and state: "Caution: fauna crossing" (or words of similar intention). BSC should consider the installation of traffic calming devices which may also be helpful in slowing traffic speeds which may further reduce fauna impacts*
- *WIRES are to be contacted on 1300 094 737 in the unlikely event that fauna become harmed during works.*

- *To mitigate the vegetation clearing associated with the proposed development and achieve no net loss of biodiversity, compensatory planting is recommended generally in accordance with the Byron Shire Development Control Plan 2014 Chapter F1 Tree and Vegetation Management.*
- *Retained* native vegetation (individual trees and copses of vegetation) proximate to works which are not subject for removal are to be clearly fenced and managed during construction activities in accordance with the Australian Standard 'AS 4970 Protection of Trees on Development Sites'.

3.5 Aboriginal Cultural Heritage

3.5.1 Existing Environment

The activity is located within the cultural heritage land boundary of TBLALC and Arakwal.

Search of the AHIMS database identified no Aboriginal sites/objects recorded within the alignment of the activity. It is acknowledged that the Sandhills Estate is place of significance for the Arakwal people.

The NSW Government's 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales' and Part 5 of the *National Parks and Wildlife Regulation 2019* defines disturbed land as 'land is disturbed if it has been the subject of human activity that has changed the land's surface, being changes that remain clear and observable'. The activity area traverses disturbed land associated with previous sand mining activities across the site.

BSC engaged with Arakwal and TBLALC regarding the location of the activity and the potential for the activity to impact Aboriginal cultural heritage (refer to Appendix F). It was advised that sand mining has impacted the broader area however the historic mining did not necessarily remove all Aboriginal Cultural Heritage ACH Objects. In particular, there are some earth mounds, which are possible mullock heaps remaining after sand mining, which could potentially contain a concentration of ACH artefacts and it was requested that any excavation of these mounds should be monitored. It was further requested by both Arakwal and TBLALC that:

- Cultural site monitoring is required during ground-breaking work; and
- Timely notice is required provided prior to commencing works.

Parts 1 and 2 of the Generic Due Diligence Process under the NSW Government's 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales' has been completed at Table 3.1.

Table 3.1 – Due Diligence Review – Part 1 and 2

Due Diligence Process Step	Comment
1. Will the activity disturb the ground surface or any culturally modified trees?	The activity will result in ground disturbance. To enable the works and tree removal. . It will not involve the removal of any culturally modified trees.
2a. Are there any relevant confirmed site records or other associated landscape feature information on AHIMS? and/or	AHIMS search of the activity area found there are no registered sites within the activity area alignment. There are six registered sites within a 1km of the activity area and the activity area occurs within 200m of the ocean and within a sand dune system, however as identified previously the activity area is disturbed land due to historic sand mining activities.

2b. Are there any other sources of information of which a person is already aware?	Aboriginal cultural heritage consultation undertaken by BSC with Arakwal and TBLALC has identified that sand mining has impacted the broader area however the historic mining did not necessarily remove all ACH Objects. In particular, there are some earth mounds, which are possible mullock heaps remaining after sand mining, which could potentially contain a concentration of ACH artefacts.
2c. Are there any landscape features that are likely to indicate presence of Aboriginal objects?	The activity area occurs within 200m of the ocean and within a sand dune system however as identified previously the activity area is disturbed land.

3.5.2 Impact Assessment

Parts 3 - 5 of the Generic Due Diligence Process under the NSW Government's 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales' has been completed at Table 3.2.

Table 3.2 – Due Diligence Review – Part 3-5

Due Diligence Process Step	Comment
If after completing steps above and no information indicates site importance, it is reasonable to conclude that there are no known Aboriginal objects or a low probability of objects occurring in the area of the proposed activity, you can proceed with caution.	
3. Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?	AHIMS search of the project area found there are no sites occurring in the general area. Within the works area there is potential some earth mounds, which are possible mullock heaps remaining after sand mining, could potentially contain a concentration of ACH artefacts.
4. Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely? Note: This step only applies if your activity is on land that is not disturbed land or contains known Aboriginal objects.	Land associated with the activity area is consistent with the definition of disturbed land. The NSW Government's 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales' defines disturbed land as 'land is disturbed if it has been the subject of human activity that has changed the land's surface, being changes that remain clear and observable'. The activity area traverses land disturbed from previous sand mining activities within the broader area. Given the activity area is identified as a place of significance for the Arakwal people. A site inspection was undertaken on 9 November 2022 with Arakwal and TBLALC. Both parties provided written support for the activity to proceed subject to the following measures:

	• Cultural site monitoring during ground breaking work; and • Timely notice provided prior to commencing works.
5. Further investigation and impact assessment	As advised by TBLALC and Arakwal, further impact assessment is not required. Council should consider the request for cultural site monitoring during groundbreaking works.

Based on the application of the Generic Due Diligence Process under the NSW Government's 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales'; further onsite investigation and assessment is not required. An Aboriginal Heritage Impact Permit (AHIP) in accordance with the NP&W Act 1974 is not required at this stage.

BSC have undertaken consultation and site walkover with Arakwal and TBLALC regarding the activity. Further detail is provided at Appendix F.

As a precautionary approach, as per Council's usual work practices, Unexpected Finds and Stop Work Protocols will be in place and implemented during the works.

The implementation of the recommended safeguards tabled below will ensure any adverse impact on Aboriginal cultural heritage will be restricted to the minimal possible extent.

Will the works involve disturbance in any area that has not been subject to previous ground disturbances?	Yes	☐	No	☒
Has online AHIMS search been completed?	Yes	☒	No	☐
Is there likely potential for the proposed works to impact on any items of Aboriginal heritage?	Yes	☐	No	☒
Will the works impact on any features that may indicate any potential archaeological remains?	Yes	☐	No	☒
Is the site subject to a Native Title determination, for which Native title was found to exist?	Yes	☐	No	☒

Aboriginal Cultural Heritage - Recommended Safeguards:

- *During the ground excavation activities the following will be undertaken .*
  - *Council to consider and determine if it is necessary for cultural site monitoring to be appointed during ground breaking work;*
  - *Timely notice shall be provided to TBLALC and Arakwal prior to commencing works*
- *CEMP is to include Byron Shire Council's Unexpected Finds and Stop Work Protocols (provided at Appendix H of the REF).*

3.6 Historic Heritage

3.6.1 Existing Environment

Searches of the State Heritage Inventory, Australian Heritage Database, and Byron LEP 2014 Maps confirm that the works are not across items of State, National or Local heritage. Heritage searches are provided at Appendix C.

The proposed works do not require the demolition of any buildings or structures that present any potential of holding heritage value.

3.6.2 Impact Assessment

The activity is not located within or across any area identified as State, National or Local heritage.

The activity does not represent risk to any known items of heritage significance.

Unexpected heritage finds may be encountered during the works and suitable unexpected finds protocols are recommended during construction of the activity.

The implementation of the recommended safeguards tabled below will ensure any potential impact on heritage will be restricted to the minimal possible extent.

Have online heritage database searches been completed?	Yes	☒	No	☐
Are there any items of non-Aboriginal heritage or heritage conservation areas located within the vicinity of the proposed works?	Yes	☐	No	☒
Are there any items of potential non-Aboriginal heritage significance within the vicinity of the works?	Yes	☐	No	☒
Are works likely to occur in or near features that indicate potential archaeological remains?	Yes	☐	No	☒

Historic Heritage - Recommended Safeguards:

- *In the event of an unexpected find, works will not recommence until signed authority is received from BSC and any necessary permits and/or approvals are obtained.*
- *Council or any Construction Contractor is to ensure all staff on site are aware of the unexpected finds protocol contained in the CEMP .*

3.7 Noise and Vibration

3.7.1 Existing Environment

Existing background noise will typically include vehicle traffic noise from local roads and noises associated with the broader coastal landscape (wave and wind) and operation of the adjoining sports grounds and skate park. The primary noise receivers likely to be impacted by the activity include:

- Residential properties located along Tennyson Street adjoining the activity area; and
- Sandhills Early Childhood Centre and YAC located adjacent to Gilmore Crescent;

DP 758207
DP 791604
DP 800268
DP 1087879
457
440
444
DP 758207
DP 758207
DP 758207

- Receivers likely to be affected by the works are notified in writing of the timing and duration of these works at least 24 hours prior to the commencement of works (except for emergency work).;

Use of plant and machinery, vehicles and works activity during the construction phase will have short-term noise impacts. Trucks and construction staff accessing the site will also be a source of intermittent noise throughout of the construction period.

All reasonable and feasible work practices will be implemented to reduce construction noise including, maintaining all construction equipment in good working order and operating equipment as per manufacturer's specifications

EPA's Interim Construction Noise Guidelines recommendations for construction noise levels include:

- The noise management level (NML) for works during the recommended standard hours is background + 10 dB(A). Above this noise level the proponent needs to implement all feasible and reasonable work practices, as defined in the Guideline, to minimise noise impacts;
- For works outside the recommended standard hours, the NML is background + 5 dB(A); and
- The highly noise-affected level of LAeq 75 dB(A) represents the point above which there may be strong community reaction to noise and indicates a need to consider other feasible and reasonable ways to reduce noise, such as restricting the times of very noisy works to provide respite to affected residences.

The proposed works will be undertaken in close proximity (<50m) to residential properties on Tennyson Street and the YAC, and it is possible that the activity will result in a highly noise-affected level of LAeq 75 dB(A) at these locations.

The works will require use of excavators, chainsaws and mechanical mulchers in close proximity (<100m) of various sensitive receivers, safeguards are considered necessary to manage noise and vibration impacts including the provision of respite periods to address highly noise-affected receivers (>/LAeq 75 dB(A)).

Use of, excavators, graders, vibratory rollers and compaction machines has potential to cause vibration within the local environment though it is unlikely that the proposed works will result in structural damage to buildings or structures. If considered necessary, BSC, as a conservative measure, would prepare building dilapidation reports for any buildings or structures within 20m of the works alignments.

In terms of operation, traffic noise impacts are likely to be experienced by adjoining properties as a result of the traffic flow across the road connection between Gilmore Crescent and Tennyson Street. Given the activity is located in an active tourist/visitor hub, is opposite a public sports ground, links into the Jarjumirr Skate Park and provides pedestrian access to local beaches; the activity area is located within an area already subject to background traffic and public noise. It is therefore reasonable to consider that the traffic noise impact of through traffic between Tennyson Street and Gilmore Crescent would result in a minor increase in background noise activity. The proposed works do not result in any operational road traffic being located closer to any adjoining residential receivers and noise mitigation is not required.

The implementation of the recommended safeguards tabled below will ensure any adverse impact regarding noise and vibration will be restricted to the minimal possible extent.

Are there any residential properties or other noise sensitive areas near the location of the proposed works that may be affected by the works (i.e. church, school, hospital)?	Yes	☒	No	☐
Are the proposed works going to be undertaken only during standard working hours?	Yes	☒	No	☐
Will the construction duration be greater than 3 weeks?	Yes	☒	No	☐

Is any explosive blasting required for the proposed works?	Yes	☐	No	☒
Will operation of the works alter the noise environment for sensitive receivers?	Yes	☐	No	☒
Will the works result in vibration being experienced by any surrounding properties or infrastructure (during either construction or operation)?	Yes	☒	No	☒

Noise and Vibration - Recommended Safeguards:

- *Construction working hours will be restricted to the normal daytime construction hours as specified by the EPA being:*
  - *7 am to 6 pm Monday to Friday.*
  - *8 am to 1 pm Saturdays.*
  - *No works will be undertaken on Sundays or Public Holidays.*
- *Works may be undertaken outside these hours where:*
  - *The delivery of materials is required outside these hours;*
  - *It is required in an emergency to avoid the risks to public safety, damage to property and/or to prevent environmental harm;*
  - *Receivers likely to be affected by the works are notified in writing of the timing and duration of these works at least 24 hours prior to the commencement of works (except for emergency work)..*
- *Notification of any receivers within 100 m of the works (letterbox drop or equivalent)is recommended including the anticipated duration of such works at least two weeks prior to undertaking the works. All notified receivers will be provided with a contact telephone number for any complaints/ updates associated with the proposed works.*
- *Noise complaints will be recorded, including suitable identification/ description of the noise source (e.g. continual/ impulsive) and general location of the complaint. Any noise complaints will be investigated and actioned as required.*
- *All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include:*
  - *All relevant project-specific and standard noise mitigation measures.*
  - *Permissible hours of work.*
  - *Any limitations on high noise generating activities.*
  - *Location of nearest receivers.*
  - *Designated loading/ unloading areas and procedures.*
  - *Escalation protocols for noise complaints.*
- *BSC may as a conservative measure, prepare building dilapidation reports for any buildings or structures within 20m of the works alignments.*

3.8 Air Quality

3.8.1 Existing Environment

Activities within the immediate area identified as potential for generating air emissions include road traffic related activities. Potential airborne particles within the locality may also be impacted by bushfires in the broader landscape.

3.8.2 Impact Assessment

The activity may generate emissions through the operation of machinery, plant and tools during construction. Of note, the works will require tree removal/mulching, earthworks and waste removal and these activities have potential to make materials airborne or enter the environment unless managed appropriately. If works are undertaken in dry and high wind conditions, there is potential for dust to be generated and impact recreational areas or nearby receivers if safeguards are not implemented.

Safeguards and mitigation measures are required to protect workers and receivers from dust and other materials produced from the activity. Mitigation measures such as covering truck loads and wetting down dust generating activities as necessary are to be employed and detailed under the Contractor's CEMP. No additional negative air quality operational impacts will occur as a result of the activity.

The implementation of the recommended safeguards tabled below will ensure any adverse impact on air quality will be restricted to the minimal possible extent.

Are the proposed works likely to result in large areas (>2ha) of exposed soils?	Yes	☐	No	☒
Will there be any dust sensitive receivers located within the vicinity of the proposed works during the construction period?	Yes	☒	No	☐
Is there likely to be an emission to air during construction?	Yes	☒	No	☐

Air Quality - Recommended Safeguards:

- *Adjacent receivers with potential to experience impacts associated with dust and other airborne particles due to works are to be notified of any potential air quality impacts prior to undertaking the works.*
- *Vehicles and vessels transporting waste or other materials that may produce odours or dust are to be covered during transportation.*
- *Disturbed surfaces and stockpiles will be wetted down or covered with geotextile fabric during high wind conditions to prevent significant dust generation, as required.*
- *All plant and machinery will be serviced at regular intervals to minimise exhaust emissions.*
- *Vehicles will be switched off when not in use.*

3.9 Traffic & Access

3.9.1 Existing Environment

The proposed road works are located within the public road reserves of Gilmore Crescent and Tennyson Street. BSC is the relevant roads authority for public roads (non-classified).

The works require extension of Tennyson Street through to Gilmore Cresent.

Pedestrian access is often used along an existing walkways between Gilmore Crescent and Tennyson Street to access the YAC, the skate park and to local beaches.

3.9.2 Impact Assessment

The works would not require excessive vehicle movements. Traffic would be generated by the activity during construction through construction worker movements (light vehicles) and truck deliveries. The impact of additional traffic movements associated with the proposed construction activities would represent a small and temporary increase compared to existing traffic movements.

The activity requires works next to live traffic and traffic control would be required to ensure construction worker and public safety.

As the works are being constructed within the public road reserve, parking within the affected sections of the road will be temporarily restricted during the construction phase. It also anticipated that formal and informal pedestrian access within the road reserve will be temporarily impacted during the construction phase of the activity.

The road works associated with Gilmore Crescent will be undertaken adjacent to the access points for the YAC and the Skate Park. It is likely that the proposed works will temporarily impact access to these areas, however the works will be planned to ensure that any temporary access restriction is minimised.

As the works are being undertaken by BSC within local roads a Section 138 approval under the *Roads Act 1993* is not required as BSC are the relevant roads authority.

Given the location of the works, current accessibility and the temporary nature of the construction period, no significant traffic impacts would result during construction.

Additional through traffic is expected following the connection of the road network from Gilmore Crescent to Tennyson Street and proposed traffic speed limit will be 50km/hour remaining consistent with urban speed limits across the local road network.

The implementation of the recommended safeguards tabled below will ensure any adverse impact on traffic and access will be restricted to the minimal possible extent.

Are the proposed works likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during construction?	Yes	☒	No	☐
Are the proposed works likely to affect any other transport nodes or transport infrastructure (e.g. bus stops, bus routes) in the surrounding area? Result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation?	Yes	☐	No	☒
Is the work likely to generate traffic to an extent that will significantly strain the capacity of the existing road system in a local government area?	Yes	☐	No	☒
Will the work involve more than minor excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	Yes	☐	No	☒

Traffic - Recommended Safeguards:

- *Where works occur next to live traffic a Traffic Control Plan (TCP) shall be prepared by a qualified person and implemented for the works in accordance with the requirements of SafeWork NSW. Licensed traffic controllers will assist with traffic control during the Project.*
- *Where possible, current traffic movements will be maintained during the works.*
- *Regard to public safety will be maintained at all times and appropriate signage will be erected and details will be confirmed by appropriate Council personnel responsible for site safety during the activity.*
- *Any traffic delay notifications will be issued by Council at least two weeks prior to commencement of works. Notification will be made via Council website and potable variable messages sign (VMS) located along the affected public road.*
- *BSC will regularly consult with affected properties along Gilmore Crescent and Tennyson Street regarding any potential property access impacts associated with the activity.*

3.10 Waste and Chemical Management

3.10.1 Existing Environment

The main types of waste currently associated with the site include mixed forms of general rubbish and other waste streams which have been left on the site from public uses or has migrated into the site via wind or flooding.

3.10.2Impact Assessment

The works will generate potential forms of waste from the construction phase including;

- Vegetation and spoil removed from site to enable the new infrastructure;
- Excavated road and pavement materials;
- Redundant lighting and services within the works areas;
- General wastes and sewerage from site compounds and offices; and
- Packaging materials from items delivered to site, such as pallets, crates, cartons, plastics and wrapping materials.

Some of these waste sources have potential to disperse into the surrounding environment, impacting soils, water, biodiversity and adjoining land uses within the surrounding lands. The proposed works would be undertaken to ensure minimal impacts are generated from waste material produced on site by ensuring that all waste products are appropriately collected, stored, reused and/or removed from site.

Spoil generated from road works will be used to balance out earthworks where possible within the site or used within other BSC road projects in accordance with NSW Waste Recovery legislation. BSC may reuse excavated natural materials in accordance with the application NSW EPA Waste exemptions regarding excavated natural materials (ENM). Any remaining waste material generated from the activity with no reuse opportunity will be disposed of at a licenced waste facility.

A ENM Validation Report prepared for the activity identifies that some spoil material generated by excavations for the activity will be suitable for reuse opportunities in accordance with the requirements of the Excavated Natural Material Order and Exemption, 2014.

Th ENM Validation Report identified that:

- The material excavated from below 1.0 m of surface level will require treatment on site for ASS and validation, following which it may be sent to a local landfill facility. Alternatively, material will be accepted at resource recovery sites in QLD for offsite neutralisation.
- Material excavated from 0.0-1.0 m of surface level, to be applied to land as engineering ill or for use in earthworks on the site of origin, or at other sites, as the soil is exempt from classification as a waste product.

ENM Validation Report is provided at Appendix E.

The implementation of the recommended safeguards tabled below will ensure any adverse impact relating to waste and chemical use will be restricted to the minimal possible extent.

Are the proposed works likely to generate >200 tonnes of waste material (contaminated and /or non-contaminated material)?	Yes	☐	No	☒
Are the proposed works likely to require a licence from OEH?	Yes	☐	No	☒
Waste and Chemical Management - Recommended Safeguards: • *Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day using skip bins.*				

- *Work to be undertaken in accordance with the Protection of the Environment Operations (Waste) Regulation 2014.*
- *Waste materials are to be categorised in accordance with the NSW EPA Waste Classification Guidelines and transferred to a licensed waste facility for the receipt of such waste.*
- *BSC shall ensure that all suitable spoil and excavated road materials are reused in accordance with the Protection of the Environment Operations (Waste) Regulation 2014 including (but not limited to):*
  - *The excavated public road material order and exemption 2014*
  - *The reclaimed asphalt pavement order and exemption 2014*
  - *The excavated natural material order and exemption 2014*
  - *Virgin Excavated Natural Material (VENM) as defined in Schedule 1 of the Protection of the Environment Operations Act 1997.*
  - *The mulch order and exemption 2016.*

3.11 Visual Amenity & Landscape

3.11.1 Existing Environment

The existing landscape character associated with the activity area consists of the following:

- Tennyson Street: Public recreation areas including sporting fields adjoining bushland associated with Lot 8 DP 1306196 and low density residences.
- Gilmore Crescent: Low density urban area (residential and community uses) connecting onto Gilmore Crescent, the skate park and bushland located within Lot 8 DP 1306196.

There are no direct lines of sight to iconic views of the Pacific Ocean or Cape Byron associated with the activity area. Street lighting is currently located within the road reserve of Gilmore Crescent and Tennyson Street within and directly adjacent to the activity alignment.

The visual landscape quality associated with the activity area is considered to be moderate with value at a local scale.

Photos of the activity area are provided at Plate 3.1 and Plate 3.2 .

Plate 3.1 View from Tennyson Street (with approximate activity area shown red)

Plate 3.2 View from Gilmore Crescent (with approximate activity area shown red)

3.11.2 Impact Assessment

Visual impacts will be created for properties adjoining the site, as construction works would be visible in most sections of the activity alignment. Ancillary sites for stockpiles and laydown areas would also have temporary visual impacts on properties with views to the activity area. The construction phase would therefore result in minor temporary visual impacts.

The activity relates to road works within existing road alignments and will not result in a significant transformation of the visual setting.

The main permanent variation of the visual environment includes the removal of bushland to enable construction and operation of a new road, shared path and associated lighting between Gilmore Crescent and Tennyson Street.

Due to the curve of the proposed road connection alignment views towards the activity area from the connection points at both Gilmore Crescent and Tennyson Street will be interrupted by stands of retained vegetation adjacent to the road alignment (refer to Figure 3.2)

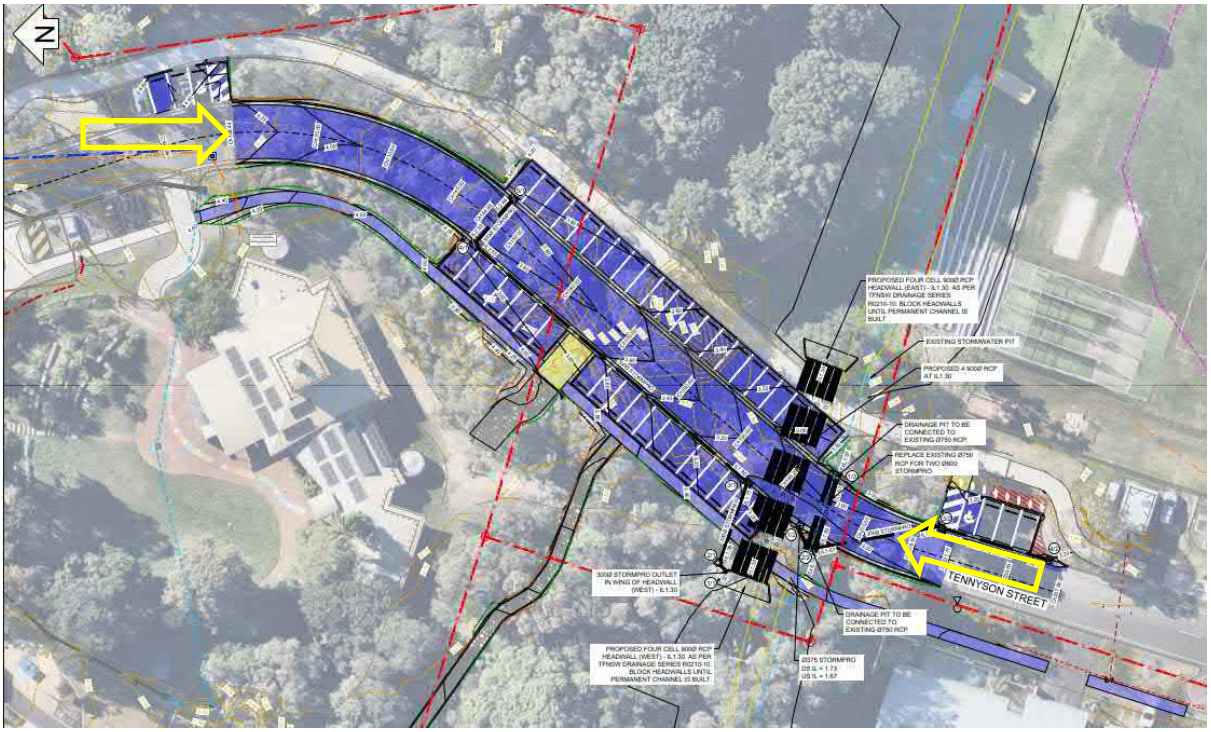

Figure 3.2 | View lines shown yellow from Gilmore Crescent and Tennyson Street

The new lighting will be compliant AS4282:2019 Obtrusive Effects of Outdoor Lighting to mitigate impact on adjoining bushland and properties, whilst also providing some passive surveillance at night. The proposed new lighting will be designed such that no additional light spill will impact on adjoining residential properties.

As identified previously the works are occurring across a cultural landscape of importance to the Arakwal people. BSC has consulted with Arakwal and TBLALC regarding the activity and have provided support for the activity (Appendix F).

The visual landscape quality associated with the activity area during operation is considered to remain moderate with value at a local scale.

Are the proposed works over or near an important physical or cultural element or landscape? (Heritage items and areas, distinctive or historic built form, National Parks, conservation areas, scenic highways etc.)?	Yes ☒	No ☐
Would the proposed works obstruct or intrude upon the character or views of a valued landscape or urban area? For example, locally significant topography, a rural landscape or a park, a river, lake or the ocean or a historic or distinctive townscape or landmark?	Yes ☐	No ☒
Would the proposal require the removal of mature trees or stands of vegetation, either native or introduced?	Yes ☒	No ☐
Would the proposal result in large areas of man-made material or clearing visible from the road or adjacent properties?	Yes ☐	No ☒
Would the proposal involve new noise walls or visible changes to existing noise walls?	Yes ☐	No ☒

Would the proposal involve substantial changes to the appearance of a bridge (including piers, girders, abutments and parapets) that are visible from the road or residential areas?	Yes	☐	No	☒
If involving lighting, would the proposal create unwanted light spillage on residential properties at night (in construction or operation)?	Yes	☐	No	☒
Would any new structures or features being constructed, result in over shadowing to adjoining properties or areas?	Yes	☐	No	☒

Visual Amenity & Landscape - Recommended Safeguards:

- *Final design for street lighting will comply with AS4282:2019 Obtrusive Effects of Outdoor Lighting to mitigate impact on adjoining bushland and properties*
- *Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day using waste collection bins.*
- *Upon completion of construction, work areas and waste stockpiles will be removed, and the activity area grassed / stabilised and cleared of all rubbish and materials.*

3.12 Bushfire

3.12.1 Existing Environment

The activity area is identified to be bushfire prone or within a bushfire prone buffer area under the *Rural Fires Act 1997*. The activity area adjoins residential areas, whose safety needs to be considered.

3.12.2 Impact Assessment

Power tools are proposed to be used at the site which have the potential to cause sparks. This would pose a risk where the works are located adjacent to forested areas.

In order to ensure that the proposed activity does not result in a fire, firefighting equipment will be kept on site. Works which could cause sparks near riparian vegetation are to cease during total fire bans. Where conditions require, the wetting down of nearby vegetation and structures on the adjacent vegetation will also reduce the risk of fire.

The following safeguards are recommended to prevent, minimise and mitigate potential negative impacts associated with the activity:

Is the site identified as bushfire prone land?	Yes	☒	No	☐
Does the activity involve a Special Fire Protection Purpose?	Yes	☐	No	☒
Will the proposed works cause an open flame/spark?	Yes	☒	No	☐

Bushfire - Recommended Safeguards:

- *A fire extinguisher is to be kept on site throughout the proposed activity.*
- *All work near vegetation involving an open flame or spark out in the open is to cease during a total fire ban unless a special exemption has been received from the RFS.*
- *The Construction Contractor is to check the Fire Danger Rating for the Far North Coast Fire Area: 1 prior to any work involving an open flame or spark out in the open commences.*

- *Construction Contractor is to make sure all staff are aware of evacuation route.*
- *In the event of a fire, 000 is to be called immediately.*

3.13 Socio-economic Considerations

There is no significant anticipated negative socio-economic impact associated with the activity. Short-term noise, amenity and traffic impacts will occur during construction works. These impacts are minor and temporary.

Works staff will need to wear PPE and undertake the works appropriately to ensure a safe work site and no negative impacts to the health of the public.

The road works will temporarily restrict street parking and pedestrian access along Tennyson Street and Gilmore Crescent during the construction phase. Works will be undertaken to ensure activities at the YAC are maintained during the construction period.

The works will have positive impacts, and social outcomes, for the YAC in the form of providing:

- Additional vehicle access point to the south of the facility
- A small number of additional public car parking spaces in the vicinity for users of the YAC
- Additional pedestrian connections to Tennyson Street, improving accessibility and safety for users and staff of the YAC; and
- Increased passive surveillance of the facility improving security.

Due to the extent of services located within and adjoining the activity area, all services will need to be clearly located prior to undertaking any excavation works. This is required to ensure that no essential services are damaged during the works and that any potential services interruptions are communicated to the relevant services authorities to enable flow on notifications to any affected services customers.

The activity Is being undertaken by BSC at the request of NSW Government, Department of Planning and Environment – Crown Lands (DPE-CL) to service Crown Reserve R755695 being former Lot 457 in DP1087879.

The road works are proposed to establish suitable vehicle access, parking, lighting and roadside pedestrian linkages to service Crown Reserve R755695. The secondary objectives of the activity are to:

- Discourage anti-social behaviour in and around Crown Reserve R755695;
- Provide accessible pedestrian and cycle linkages to and through Byron Bay;
- Accommodate and improve stormwater management as part of the Byron Bay Drainage Upgrade;
- Minimise any environmental impacts associated with the construction and operation of the activity.

The following safeguards are recommended to prevent, minimise and mitigate potential negative impacts associated with the activity:

Are the proposed works likely to directly impact on local business?	Yes ☐ No ☒

Are the proposed works likely to require any property acquisition?	Yes ☒	No ☐
Are the proposed works likely to alter any access for properties (either temporarily or permanently)?	Yes ☒	No ☐
Are the proposed works likely to alter any on-street parking arrangements (either temporarily or permanently)?	Yes ☒	No ☐
Are the proposed works likely to change pedestrian movements or pedestrian access (either temporarily or permanently)?	Yes ☒	No ☐
Are the proposed works likely to impact on any items or places of social value to the community (either temporarily or permanently)?	Yes ☒	No ☐
Are the proposed works likely to reduce or change visibility of any businesses, farms, tourist attractions or the like (either temporarily or permanently)?	Yes ☐	No ☒

Socio-economic Considerations - Recommended Safeguards:

- *Contractors/ workers would be mindful of the needs of the local community.*
- *In accordance with the Work Health and Safety Act 2011, workers would be provided with appropriate safety clothing and equipment. Supervisory staff and any visitors to the work area would also be required to wear protective clothing. Works personnel would be provided with or expected to have protective equipment and appropriate training.*
- *Prior to undertaking any excavation works all underground services will be clearly located. Any potential services interruptions shall be communicated to the relevant services authorities to enable flow on notifications to any affected services customers.*

3.14 Red Imported Fire Ants

NSW DPI has issued an Emergency Order (as amended), that places restrictions on the movement of fire ant carrier materials including (but not limited to) organic mulch, soil, and anything with soil on it, hay and baled material, potted plants, turf, agriculture, or earth moving machinery, mining or quarry materials, sand and gravel being moved into NSW from the fire ant infested areas of QLD, South Murwillumbah, and Wardell.

The Emergency Order refers to the following control areas:

- defines the QLD fire ant infested area (red), which includes 5 km around all detections in QLD.
- defines the NSW fire ant infested area (orange), which includes areas in NSW within 5 km the detection in QLD.
- defines the NSW fire ant movement control areas (yellow) in South Murwillumbah and Wardell, which includes 5 km around all detections
- defines the NSW Protection Zone (blue hatched), which is the whole of NSW excluding fire ant infested areas or movement control areas..

A list of current fire ant carrier materials is provided at https://www.dpi.nsw.gov.au/dpi/bfs/insect-pests/rifa

Carrier materials from and through the fire ant infested areas mapped below are subject to the requirements in the Order.

Material imported to site for the works from risk areas have potential to spread the fire ant further into NSW presenting further biosecurity risk. Measures are therefore required to ensure the works do not increase risks associated with the fire ant spread in the region.

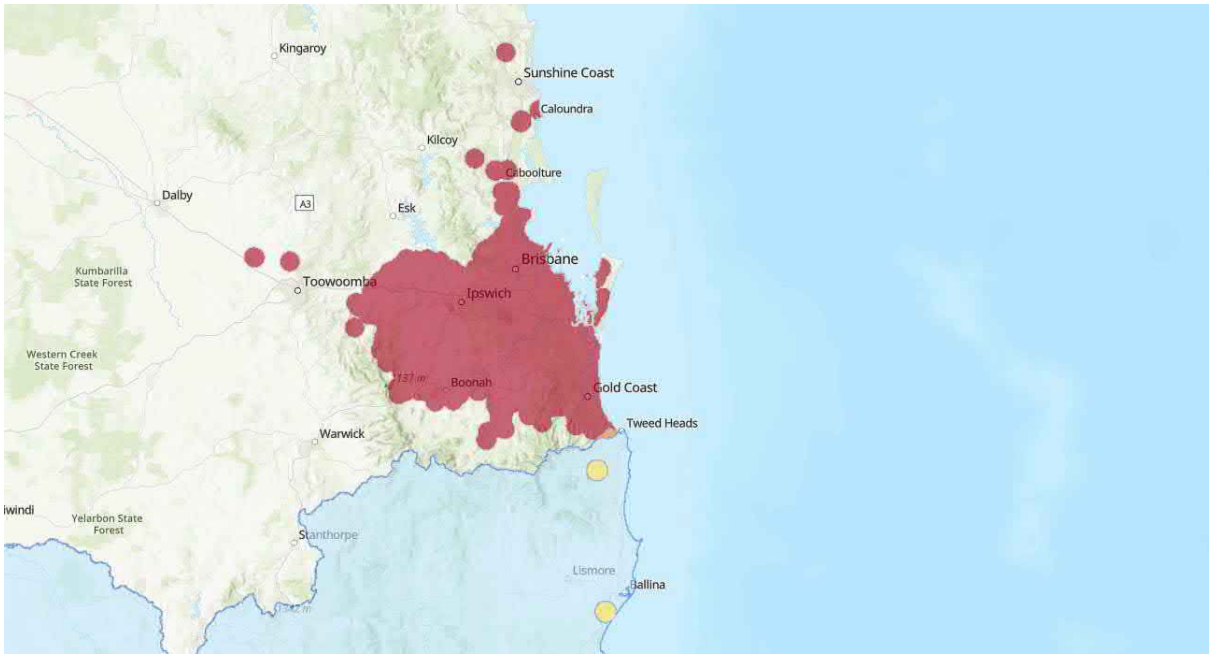

Figure 3.3 | Fire ant infested area map (Source: NSW DPI)

The implementation of the following recommended safeguards, any adverse effect will be restricted to the minimal possible extent.

Red Imported Fire Ants - Recommended Safeguards:

- *Prior to the use of materials and equipment that has travelled through or from a biosecurity zone, Project Managers are to ensure that contractors supply the necessary certificates for any of the materials and equipment. The biosecurity zones are shown at the NSW DPI Alert https://www.dpi.nsw.gov.au/dpi/bfs/insect-pests/rifa*
- *Moving fire ant carriers from the fire ant infested area of Queensland into NSW (the Emergency Zone) must:*
    - *Follow the requirements as specified for each fire ant carrier in part 2 of the emergency Orderhttps://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants*
    - *Obtain an approved biosecurity certificate for fire ant carrier materials.*
    - *Complete the record of movement Declaration form prior to the carriers moving into NSW*
- *Moving fire ant carriers out of the NSW fire ant movement control area in South Murwillumbah into the rest of NSW (the Emergency Zone) you must follow the requirements specified in Part 3 of the Emergency Order. https://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants.*
- *If red imported fire ants are suspected at or adjoining the works areas, stop work immediately, notify DPI of the issue and commence the following:*
    - *Suspicious sightings of red imported fire ants or their mounds that have been identified within a site must be reported to NSW Department of Primary Industries immediately on 1800 680 244 or via their online form https://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants*
    - *If red imported fire ants are suspected, do not disturb the ants or nests and make records of the ants and nest (including photographic record) as outlined in the NSW*

DPI Alert https://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants
https://www.dpi.nsw.gov.au/biosecurity/insect-pests/fire-ants

- *If red imported fire ants are suspected at or adjoining the works areas, works may not commence until:*
    - *DPI will work with the National Fire Ants Eradication Program to search the surrounding areas, treat the ants, and stop their spread, at no cost to the owners or occupiers.*
    - *A temporary requirement to only move certain materials and items off the property under permitted conditions could be put in place while the ants are controlled.*
    - *The ants are treated and monitored until it is clear they have been eradicated.*

3.15 Cumulative impacts

It is noted that the Jarjumirr Skatepark has been completed, however there are three additional projects nearby currently under construction including:

- Sandhills Wetland Project located directly east of the activity area;
- Byron Bay Drainage Strategy Stage 1 (Town Centre) west of the activity area; and
- Various water supply projects in Byron Bay including water reticulation pipe works along Bangalow Road and proposed replacement of Paterson Street Water Reservoir.

There is potential that construction impacts associated with these projects may add a cumulative impact to the local amenity during construction phase of the projects. Due to the landform, scale and location of these projects a significant impact on amenity is however unlikely. It is recommended that BSC and the contractor develop the works schedules to consider the nearby construction projects to minimise any cumulative impacts on local amenity.

No other external projects are known to be proposed or occurring in the vicinity of the site shortly before, during or after the proposed activity.

The following safeguards are recommended to prevent, minimise and mitigate potential impacts associated with the activity:

Are other projects proposed to be undertaken at the same time within the vicinity of the proposal?	Yes ☒ No ☐
Are there considered to be significant cumulative impacts as a result of the works proposed?	Yes ☐ No ☒

Cumulative Impacts - Recommended Safeguards:

- It is recommended that BSC and the contractor develop the works schedules to consider the nearby construction projects to minimise any cumulative impacts on local amenity.

3.16 Matters of National Environmental Significance (NES)

The following matters identified in **Table 3.3** are required to be considered under the EPBC Act when determining if the proposal should be referred to the Commonwealth Department of Environment and Energy for assessment.

Table 3.3 | Review of Matters of NES

Matters of NES	Significant Impact
Any impact on a World Heritage property?	Yes ☐ No ☒
The activity is not located on or within proximity to a World Heritage property.	
Any impact on a National Heritage place?	Yes ☐ No ☒
The activity is not located on or within proximity to a National Heritage Place.	
Any impact on a wetland of international importance?	Yes ☐ No ☒
The activity is not located on or within proximity to a wetland of international importance.	
Any impact on a listed threatened species or communities?	Yes ☐ No ☒
The activity will not have any significant long-term impacts on threatened species or communities.	
Any adverse impacts on listed migratory species?	Yes ☐ No ☒
The activity will not have any significant impacts on listed migratory species.	
Does the proposal involve a nuclear action (including uranium mining)?	Yes ☐ No ☒
No nuclear action proposed.	
Any impact on a Commonwealth marine area?	Yes ☐ No ☒
The activity is not located on or within proximity to a Commonwealth marine area.	
Any impact on the Great Barrier Reef Marine Park?	Yes ☐ No ☒
The activity is not located on or within proximity to the Great Barrier Reef Marine Park.	
Any impact on water resources from coal seam gas development and large coal mining development?	Yes ☐ No ☒
No coal seam gas or coal mine is development proposed.	
Additionally, any significant impact (direct or indirect) on Commonwealth land?	Yes ☐ No ☒
No impact on Commonwealth land is proposed.	

Matters of NES	Significant Impact
Additionally, any significant impact (direct or indirect) on the environment generally as a result of a Commonwealth action?	Yes ☐ No ☒
No significant impact on the environment as a result of a Commonwealth action is proposed or likely.	

This REF has determined that the proposed activity does not require referral to the Commonwealth Department of Environment and Energy for assessment as will not have any significant impacts on matters of NES.

3.17 Clause 171 of the EP&A Regulations 2021 (the Regulations)

Clause 171 of the Regulation sets out 16 factors that need to be considered when assessing environmental impact under Part 5 of the EP&A Act. These factors are addressed in this report and are listed in Table 3.4.

Table 3.4 | Review of Clause 171 Factors

Clause 171 Factors	Adverse Impact
Any environmental impact on a community?	Yes ☐ No ☒
The proposal will have some minor negative impacts associated with traffic, parking and pedestrian access. However, the activity will have a long term positive impact through improved roads to service Crown Lands and community and recreation facilities, the provision of safe and accessible pedestrian and cycle linkages to and through Byron Bay, improved stormwater management and improved safety from increased passive surveillance in the area	
Any transformation of a locality?	Yes ☐ No ☒
The proposed road works pathway and new lighting will represent variation to existing landscape however the works are relatively minor and will benefit the community. The activity will not result in a transformation of the local area.	
Any environmental impact on the ecosystems of the locality?	Yes ☐ No ☒
Reference should be made to Section 3 of this REF. No detrimental environmental impact to ecosystems is likely to occur as part of the activity.	
Any impact on the aesthetic, recreational, scientific or other environmental quality or value of a locality?	Yes ☐ No ☒
The activity is unlikely to detrimentally impact on the aesthetic, recreational, scientific or other environmental quality or value of the locality. The activity is likely to have a positive impact on the recreational quality and value of the locality.	
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?	Yes ☐ No ☒
Reference should be made to Section 3 of this REF. No impact to items of anthropological, archaeological, architectural, cultural, historical, scientific or social significance are anticipated.	

Any impact on the habitat of protected animals (within the meaning of the Biodiversity Conservation Act 2016)?	Yes ☐ No ☒
The proposed activity will not have any adverse impacts on the habitat of protected animals.	
Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	Yes ☐ No ☒
The proposed activity will not cause the endangering of any species of animal, plant or other form of life.	
Any long-term effects on the environment?	Yes ☐ No ☒
The proposal is not considered to have any long-term effects on the environment.	
Any degradation of the quality of the environment?	Yes ☐ No ☒
The proposed activity will not degrade the quality of the environment.	
Any risk to the safety of the environment?	Yes ☐ No ☒
Minor short-term risks are likely and can be managed through appropriate safe work practices. These procedures have been recommended under this REF.	
Any reduction in the range of beneficial uses of the environment?	Yes ☐ No ☒
No reduction in the range of beneficial uses of the environment will occur.	
Any pollution of the environment?	Yes ☐ No ☒
Suitable construction methods will ensure there is no pollution of the environment and all waste will be disposed of correctly. These procedures have been recommended under this REF.	
Any environmental problems associated with the disposal of waste?	Yes ☐ No ☒
Any waste generated from the works will be categorised and disposed of in accordance with the relevant guidelines and all so as not to cause environmental problems.	
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?	Yes ☐ No ☒
The proposal will not increase demands on resources.	
Any cumulative environmental effect with other existing or likely future activities?	Yes ☐ No ☒
No significant cumulative impacts have been identified.	
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?	Yes ☐ No ☒
The activity is located within the coastal zone but will not contribute to coastal processes and coastal hazards.	

The factors listed under Clause 171 have been considered and all impacts associated are considered acceptable.

As the activity does not require an approval or permit listed under Clause 171 (4), and does not have a capital investment value of more than $5 million, BSC is not required to publish the REF on the determining authority's website or the NSW planning portal.

4 Statutory and Planning Considerations

4.1 Planning Approval Pathway

The activity is being undertaken by BSC at the request of NSW DPIE-Crown Lands to support implementation of BSCs Sandhills Estate Activation project. The activity will involve extension of Gilmore Crescent through to Tennyson Street including the provision of roadside parking, pedestrian pathways and services adjustments.

Section 4.1 of the EP&A Act confirms that if an environmental planning instrument (EPI) provides that development may be carried out without the need for development consent, a person may carry the development out, in accordance with the EPI, on land to which the provision applies.

T&I SEPP aims to facilitate the effective delivery of infrastructure across NSW. Division 17, Clause 2.108 and 2.109 (1) of T&I SEPP specifies that development for the purposes of road or road infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land.

BSC is a public authority as defined under clause 2.3 of T&I SEPP. The proposed activity is consistent with the definition of road or road infrastructure facilities as defined under clause 2.108 of T&I SEPP and therefore can be undertaken by BSC without requiring development consent pursuant to Clause 2.109 (1) of T&I SEPP.

The activity will also include new drainage culverts running under the road extension including replacement of the existing 750RCP pipe and construction of a 4x cell culvert and headwall that will link into BSC drainage works proposed in the future under a separate scope of works. The works are ancillary to the road extension works, however these works are also permitted without consent in accordance with Division 20 Stormwater Management Systems, Clause 2.137 (1) of T&ISEPP.

The proposal is not located on land reserved under the National Parks and Wildlife Act 1974 and does not constitute Designated Development, State Significant Development or State Significant Infrastructure in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021 or State Environmental Planning Policy (Planning Systems) 2021.

BSC is still required to undertake due diligence and environmental assessment before commencing the work to ensure it has had due regard to any potential environmental impacts. This is the purpose of this REF.

4.2 Commonwealth Legislation

4.2.1 Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act protects matters of National Environmental Significance (NES), such as threatened species and ecological communities and migratory species (protected under international agreements), promotes ecologically sustainable development, conservation of biodiversity and heritage places and recognises the knowledge of Indigenous Australians. Any actions that will, or are likely to have, a significant impact on the matters of NES require referral and approval from the Australian Government Environment Minister. Significant impacts are defined by the Commonwealth for matters of NES.

As outlined in Section 3.16, the activity will not result in an impact on matters of NES, therefore referral to the Commonwealth Department of Environment is not required.

4.2.2 Native Title Act 1993 (NT Act 1993)

The Native Title Act 1993 (NT Act) provides recognition and protection of native title on land across Australia. The NT Act establishes ways which future dealings affecting native title claim may be processed and establishes mechanisms for determining native title claims.

Indigenous Land Use Agreement (ILUA) NI2006/004 applies to the land, under which native title rights and interest have been surrendered. Council has satisfied itself that no action is required under the *Native Title Act 1993*.

4.3 State Legislation

4.3.1 *Aboriginal* Land Rights Act 1983 (ALR Act)

The ALR Act recognises the traditional ownership of lands by Aboriginal peoples and the importance of ongoing connection to Country. The purposes of the ALR Act include supporting self-determination and facilitating the return of lands to Aboriginal People.

Former Lot 457 in DP1087879 is the subject of an undetermined Aboriginal Land Claim under the Land Rights Act 1983 (NSW) by NSW Aboriginal Lands Council (NSW ALC). NSWALC have authorised the Tennyson Street extension works.

4.3.2 *Environmental Planning and Assessment Act 1979* (EP&A Act)

The EP&A Act is the principal planning legislation for NSW and provides a framework for the overall environmental planning and assessment of proposals.

BSC is the proponent, and the works are assessed as 'development permissible without consent' under Part 5 of the EP&A Act. Accordingly, BSC must satisfy Sections 5.5, 5.6 and 5.7 of the EP&A Act by examining, and considering to the fullest extent possible, all matters which are likely to affect the environment. This REF is intended to assist and ensure compliance with the EP&A Act including Sections 5.5, 5.6 and 5.7 and the requirements of clause 171 of the Regulations.

4.3.3 *Biodiversity Conservation Act 2016*

Section 7.8 of the BC Act provides the environmental assessment requirements for activities being assessed under Part 5 of the EP&A Act. If a significant impact is likely, the Environmental Impact Statement is to be accompanied by a Species Impact Statement, or if the proponent so elects, a Biodiversity Development Assessment Report.

Section 7.3 of the BC Act prescribes a test (the 'Test of Significance') for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. A Test of Significance has been completed for the activity (refer Appendix B).

The results of the tests concluded that the proposal would not significantly affect threatened species or ecological communities, or their habitats. On this basis, the Biodiversity Offsets Scheme established in the BC Act is not triggered, and a Biodiversity Development Assessment Report (BDAR) is not required.

4.3.4 *Coastal Management Act 2016 (CM Act)*

The CM Act aims to manage the coastal environment of New South Wales in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State. The CM Act defines the coastal zone and management objectives for coastal management areas and allows local Councils to prepare coastal management programs.

The activity is located within the coastal zone. However, the activity does not present any conflict with the provisions of the CM Act.

4.3.5 *Contaminated Land Management Act 1997 (CLM Act)*

Section 59 of the CLM Act requires the notification of contaminated sites. The NSW Environment Protection Authority's (EPA) Contaminated Lands Register does not list any sites within proximity to the works as contaminated sites.

A search of the NSW EPA Contaminated Lands Register returned no results for the proposed activity area alignment.

The nearest registered cattle dip site (Andersons) is located at Belongil Beach within SP85426, approximately 1.7km west of the site. Radiation and land contamination assessment was undertaken for the broader Sandhills Estate Activation project (refer to Appendix D) identifying that radiation levels within the activity area range between 0.08 to 0.36 uSv.hr1 at 1 metres above ground level;

identifying that radiation levels comply with the applicable health guidelines and that the site is suitable for proposed uses including roads and paths.

The EPA will need to be notified if other sources of contamination that present a risk of harm to human health or the environment are identified as part of the proposed activity.

4.3.6 Crown Land Management Act 2016 (CLM Act)

The *Crown Land Management Act 2016* (CLM Act) regulates the ownership, use and management of Crown Land and requires environmental, social, cultural heritage and economic considerations to be taken into account in decision-making about Crown Land.

The activity is being undertaken by BSC at the request of NSW Government, Department of Planning and Environment - Crown Lands (DPE-CL).

4.3.7 Forestry Act 2012

Section 60 of the Forestry Act 2012 requires that a permit be obtained for the use of a forestry area for non-forestry uses. The activity area does not form part of a state forest; therefore, no permit is required.

4.3.8 Fisheries Management Act 1994

The objectives of the Fisheries Management Act 1994 are to conserve, develop and share the fishery resources of the State for present and future generations.

The activity is not located within a Key Fish Habitat waterway and there are no mapped waterways within the site. The activity does not require any works within a waterway.

The works will not require permits under Part 7 of the *Fisheries Management Act 1994*.

4.3.9 Heritage Act 1977

The Heritage Act 1977 makes provision for the promotion and conservation of the state's heritage.

Searches of the State Heritage Inventory, Australian Heritage Database, and LEP Maps confirm that the works are not across or located near items of State, National or Local heritage.

4.3.10 Local Land Services Act 2013 (LLS Act)

The objectives of the LLS Act include 'to ensure the proper management of natural resources in the social, economic and environmental interests of the State, consistently with the principles of ecologically sustainable development'.

The Act regulates the clearing of native vegetation; however, section 60(O)(b)(ii) excludes the need for consent under the LLS Act where the clearing is an activity carried out by a determining authority within the meaning of Part 5.1 of the EP&A Act.

The activity does not require approval for removal of native vegetation under the LLS Act.

4.3.11 National Parks and Wildlife Act 1974 (NP&W Act)

The National Parks and Wildlife Act 1974 (NP&W Act) regulates the control and management of all national parks, historic sites, nature reserves, and Aboriginal objects and areas. The site is not located proximate to any national park, historic site, reserve or places of Aboriginal cultural significance.

The main aim of the NP&W Act 1974 is to conserve the natural and cultural heritage of NSW and where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit (AHIP) is required.

An Aboriginal Heritage Impact Permit (AHIP) in accordance with the NP&W Act 1974 is not required for the activity at this stage.

4.3.12Protection of the Environment Operations Act 1997 (POEO Act)

The POEO Act is the key environmental protection and pollution statute. The POEO Act is administered by the EPA and establishes a licensing regime for waste, air, water and pollution. The following summarises key heads of consideration under the POEO Act:

- The project contractor is required to notify EPA if a 'pollution incident' occurs during works, that is likely to impact upon the environment.
- The REF includes mitigations measures to minimise potential impacts that may result in pollution of waters

Section 143 of the POEO Act requires waste to be transported to a place that can lawfully accept it. All waste generated from the works will need to be classified pursuant to the EPA Waste Classification Guidelines and certificates obtained for its disposal.

4.3.13 Water Management Act 2000 (WM Act)

The main objective of the WM Act is to manage NSW water in a sustainable and integrated manner that will benefit today's generations without compromising future generations' ability to meet their needs. The works do not occur within or adjacent to a waterway.

Section 91E of the WM Act establishes an approval regime for controlled activities within waterfront land. Clause 41 of the *Water Management (General) Regulation 2018* provides an exemption for public authorities in relation to all controlled activities on waterfront land. Therefore, approval under the WM Act 2000 is not required.

The Minister's approval under Section 92 of the *Water Management Act 2000* is required to construct and use a water supply works approval including approval for construction dewatering to construct and use a work which takes water from a construction site, including water entering the site from an aquifer (groundwater source) and surface water flowing into the site.

Examples of water supply works for construction dewatering include water pumps, water bores, drainage channels and pipes.

Roads Authorities (includes Councils) are exempt from requirement for a Water Access License approval (construction dewatering) in relation to road construction activities in accordance with Clause 21(1) and Clause 2 of Schedule 4 of *Water Management (General) Regulation 2018* (see below)

4.3.14 Water Management (General) Regulation 2018

Clause 21(1) and Clause 2 of Schedule 4 of *Water Management (General) Regulation 2018* creates exemptions for a water access license in relation to construction dewatering undertaken by a road authority in relation to road construction:

21 Exemption from requirement for access licence

(1) A person is exempt from section 60A(1) and (2) of the Act in relation to the taking of water from a water source if the person—

(a) is specified in any provision of Part 1 of Schedule 4, and

(b) takes water for any of the purposes, and in the circumstances, specified in that provision.

Schedule 4 Exemptions

(Clauses 21 and 42)

Part 1 Access licence exemptions

1 Definition

In this Part—

public authority does not include Landcom or the Superannuation Administration Corporation or any of their subsidiaries.

2 Roads authorities

A roads authority (within the meaning of the Roads Act 1993)—in relation to water required for road construction and road maintenance.

4.3.15Roads Act 1993

Section 138 of the Roads Act 1993 requires the approval from the relevant road's authority for the carrying out of works within a public road. Part 5(1) of Schedule 2 of the Roads Act 1993 also states that public authorities do not require consent for works on unclassified roads. Gilmore Crescent and Tennyson Street are local roads (non-classified) under management of BSC as the local roads authority.

The activity is being undertaken by BSC (local roads authority) and approval under Section 138 of the Roads Act 1993 is not required for the activity.

Section 92 of the Roads Act 1993 enables a roads authority to alter the landform of land adjoining a public road so as to ensure the stability of the road and requires that the roads authority must pay compensation to the owner of the land for any loss or damage arising from the alteration. No alternations are proposed that would result in any requirement to compensate and adjoining owner

4.3.16Rural Fires Act 1997

The works are proposed upon land that is identified as being within a bushfire prone and bushfire prone buffer area. The works are not development for the purposes of Section 100B of the Rural Fires Act 1997 and a bush fire safety authority is therefore not required.

4.3.17Wilderness Act 1987

Proposals by statutory authorities affecting certain wilderness areas are required to be notified to the Minister and receive consent from the Minister under Section 15 of the Act. The proposal does not involve any activity in a declared wilderness area. Therefore, the Act does not apply to the activity.

4.3.18 *Waste Avoidance and Resource Recovery Act 2001* (WARR Act)

The purpose of the WARR Act is to develop and support the implementation of regional and local programs to meet the outcomes of a State-wide strategy for waste avoidance and resource recovery. It also aims to 'minimise the consumption of natural resources and final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste'.

Waste generation and disposal reporting will be carried out during the construction of the proposal. Procedures will be implemented to promote the objectives of the WARR Act.

4.4 Environmental Planning Policies under the EP&A Act

4.4.1 State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP)

As discussed under Section 4.1 of this REF, Division 17, Clause 2.108 and 2.109 (1) of T&I SEPP specifies that development for the purposes of road or road infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land.

The activity relates to road and road infrastructure works to be undertaken by BSC. The activity may therefore by undertaken pursuant to clause 2.109 (1) of T&I SEPP.

The activity will also include new drainage culverts running under the road extension including replacement of the existing 750RCP pipe and construction of a 4x cell culvert and headwall that will link into BSC drainage works proposed in the future under a separate scope of works. The works are ancillary to the road extension works, however these works are also permitted without consent in accordance with Division 20 Stormwater Management Systems, Clause 2.137 (1) of T&ISEPP.

Part 2.2 of the T&I SEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation,

including consultation as required by T&I SEPP (where applicable), is discussed in Section 5 of this REF.

The activity is not for the purposes of a health services facilities, correctional centres or residential accommodation., in an area that is bush fire prone land (as defined by the Act). BSC is not required consider Planning for Bush Fire Protection before carrying out the development under clause 2.16 of T&ISEPP.

4.4.2 Other Environmental Planning Instruments (EPIs)

Table 4.1 provides a review of other Environmental Planning Instruments (EPIs) made under the EP&A Act. Whilst not applicable, this review of EPIs has been undertaken to assist in confirming the suitability, likely impacts, and necessary environmental considerations for the proposed activity. This review has confirmed that the activity is consistent with the aims and objectives of the EPIs and EP&A Act.

Table 4.1 | EPI Review

EPI	Section	Comment
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008	Subdivision 38 Subdivision	Clause 2.75 enables the subdivision of land for the purposes of excising from a lot land that is, or is intended to be, used for public purposes. The activity does not require subdivision of land. As detailed in section 4.3.13 the road reserve can be created under provisions of the Roads Act 1993.
State Environmental Planning Policy (Resilience and Hazards) 2021 (R&H SEPP)	Chapter 2 Coastal management	The proposed activity is located within the coastal zone. The activity is not located on land mapped Coastal Wetland or Littoral Rainforest. The activity is precluded from requiring development consent pursuant to provisions of T&I SEPP. Therefore, the provisions of the R&H SEPP do not apply to the development.
	Chapter 3 Hazardous and offensive development	The proposed activity is not defined as a “potentially hazardous industry” or “potentially offensive industry”.
	Chapter 4 Remediation of land	The proposed works do not require remediation of land.
State Environmental Planning Policy (Biodiversity and Conservation) 2021	Chapter 4 Koala habitat protection 2021	The SEPP indicates when a Koala Plan of Management is required in regard to development that requires consent. As the activity is permitted without consent the provisions of the SEPP do not apply.
State Environmental Planning Policy (Planning Systems) 2021	Chapter 3 Aboriginal land	The Aboriginal Land SEPP only applies to land identified on the Land Application Map. The subject site is not identified on the Land Application Map.
	Schedule 1-7	The activity is not identified as Regionally Significant Development, or State Significant Development

EPI	Section	Comment
State Environmental Planning Policy (Precincts—Regional) 2021		The subject site is not located within a Regionally significant precinct.
Byron Local Environmental Plan 2014		The activity area is zoned Zone RE1, R2 and DM, under the LEP 2014. The activity is precluded from requiring development consent pursuant to provisions of T&I SEPP.

Approval under Section 92 of the *Water Management Act 2000* is required to construct and use a water supply works approval including approval for construction dewatering to construct and use a work which takes water from a construction site, including water entering the site from an aquifer (groundwater source) and surface water flowing into the site.

Examples of water supply works for construction dewatering include water pumps, water bores, drainage channels and pipes.

An exemption for a Water Access License for construction dewatering under Schedule 4 of the *Water Management (General) Regulation 2018* applies (see Section 4.3.13).

5 Consultation Requirements

5.1 Consultation Requirements under Infrastructure SEPP

Part 2.2 Division 1 of the T&I SEPP requires public authorities to consult with Councils and other public authorities prior to the commencement of specified development. These requirements are summarised in Table 5.1.

Table 5.1 | Consultation Requirements Checklist

Infrastructure SEPP, Part 2.2, Division 1 Consultation	
Consultation with councils – development with impacts on council-related infrastructure or services	
Will the proposal have a substantial impact on stormwater management services provided by a council?	Yes ☐ No ☒
Is the proposal likely to generate traffic to an extent that will strain the capacity of the road system in a local government?	Yes ☐ No ☒
Will the proposal involve connection to, and a substantial impact on the capacity of, any part of a sewerage system owned by a council?	Yes ☐ No ☒
Will the proposal involve connection to, and use of a substantial volume of water from, any part of a water supply system owned by a council?	Yes ☐ No ☒
Will the proposal involve the installation of a temporary structure on, or the enclosing of, a public place that is under a council's management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential?	Yes ☐ No ☒
Will the proposal involve excavation that is not minor or inconsequential of the surface of, or a footpath adjacent to, a road for which a council is the roads authority under the *Roads Act 1993* (if the public authority that is carrying out the development, or on whose behalf it is being carried out, is not responsible for the maintenance of the road or footpath)?	Yes ☐ No ☒
Consultation with councils – development with impacts on local heritage	
Is the proposal likely to affect the heritage significance of a local heritage item, or of a heritage conservation area, that is not also a State heritage item, in a way that is more than minor or inconsequential, and is development that this Policy provides may be carried out without consent?	Yes ☐ No ☒
Consultation with councils – development with impacts on flood liable land	
Is the proposed activity located on flood liable land and will change flood patterns other than to a minor extent?	Yes ☒ No ☐
Comment: The proposed activity is mapped flood prone land. The works are not considered to create a new barrier for floodwaters or likely to change the flood patterns of the locality.	

Infrastructure SEPP, Part 2.2, Division 1 Consultation				
Consultation with State Emergency Service – development with impacts on flood liable land				
Is the proposed activity permitted without consent under a **relevant provisions** and located on flood liable land?	Yes	☒	No	☐
Comment- The activity relates to road works permitted without consent under a listed relevant provision. State Emergency Service (SES) were notified of the proposal. NSW SES response is outlined below.				
Consultation with councils – development with impacts on certain land within the coastal zone				
Is the proposed development on land that is within a coastal vulnerability area and is inconsistent with a certified coastal management program that applies to that land?	Yes	☐	No	☒
Consultation with public authorities other than councils				
Is the 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?	Yes	☐	No	☒
Is the 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?	Yes	☐	No	☒
Is the development adjacent to an aquatic reserve or a marine park declared under the Marine Estate Management Act 2014—the Department of Industry?	Yes	☐	No	☒
Is the development in the foreshore area within the meaning of the Sydney Harbour Foreshore Authority Act 1998—the Sydney Harbour Foreshore Authority?	Yes	☐	No	☒
Is the development comprising a fixed or floating structure in or over navigable waters—Roads and Maritime Services?	Yes	☐	No	☒
Will the development 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?	Yes	☐	No	☒
Is the 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?	Yes	☐	No	☒
Is the development on land in a mine subsidence district within the meaning of the Mine Subsidence Compensation Act 1961—the Mine Subsidence Board?	Yes	☐	No	☒

The activity requires consultation under Clause 2.13 of T&I SEPP with SES who were notified of the proposal on 22 November 2022.

The NSW SES provided following advice regarding the activity on 22 January 2024:

- Consider the impact of flooding on the infrastructure up to and including the probable Maximum flood (PMF) and including people using the roads.
- Pursue, if relevant, site design and stormwater management that minimises any risk to the community.
- Ensure workers and people using the site during and after the upgrades are aware of the flood risk, for example by using signage.
- During site works, check the Bureau of Meteorology website prior to start of the workday for any Flood Warnings, and consider closing the worksite prior to the start of the working day if there is a risk of flooding.
- Ensure that all facilities and equipment including any material temporarily stored in any laydown site is appropriately secured during a weather event.
- Consider how the location of any site vehicles and infrastructure, including any installed temporary traffic controls, may affect the flow of traffic during a flood event.
- If the construction phase of the upgrades causes disruption to the operation of local roads, this may impact the ability for emergency vehicles to use these routes. The NSW SES requests that notification be provided where there are likely to be significant delays in the operation of the roads affected by the upgrades.

The full response provided by SES is located at Appendix G.

5.2 Consultation Requirements under CPP

The Byron Community Participation Plan does not prescribe a requirement for broad community consultation. For significant, controversial or highly complex projects, BSC may notify and exhibit the REF before it is finalised and approved by Council. The proposed activity is not considered to be significant, controversial or complex.

5.3 Additional consultation and notification requirements

The following consultation and notification are proposed for the activity:

- Timely notice shall be provided to TBLALC and Arakwal prior to commencing works.
- Notification of any receivers within 100 m of the works (letterbox drop or equivalent) is recommended including the anticipated duration of such works at least two weeks prior to undertaking the works. All notified receivers will be provided with a contact telephone number for any complaints/ updates associated with the proposed works.
- Adjacent receivers with potential to experience impacts associated with dust and other airborne particles due to works are to be notified of any potential air quality impacts prior to undertaking the works.
- Any traffic delay notifications will be issued by Council at least two weeks prior to commencement of works. Notification will be made via Council website and potable variable messages sign (VMS) located along the affected public road.

6 Mitigation Measures

Environmental safeguards and management measures outlined in this REF are recommended to be implemented during the works. The safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The safeguards and management measures are summarised at Table 6.1.

Table 6.1 | Mitigation Measures

Safeguards/Mitigation Measures
1. General
• *A CEMP is to be prepared prior to any construction works commencing. The CEMP is to include the mitigation measures listed under this Table.* • *The* proposed activity will require a temporary site compound within and adjacent to the activity area including the public road reserve to support construction of the road and road infrastructure facilities and will include staff amenities, stockpile areas, laydown areas and staff parking. • NSW SES notification shall be provided where there are likely to be significant delays in the operation of the roads affected by the upgrades via attention Suede Stanton-Drudy - email rra@ses.nsw.gov.au.
2. Landform, Geology and Soils
• Site management will incorporate best management erosion and sediment control practices such as those found in the Department of Housing's "Blue Book (4th Edition) on erosion and sediment control and Safe Work Australia 'Excavation Code of Practice (March 2015). • Non-ASS excavated material should be temporarily placed in the form of a bund upslope of the site where necessary to reduce surface water entering the construction areas. • All erosion and sediment control devices will be visually inspected weekly and before forecast rain events to ensure effectiveness as well as after each rainfall event. • Wash down, if undertaken at the site, must be undertaken in a designated and controlled (bunded and plastic lined) area within the site. Wash down shall use potable water and excess debris removed using hand tools. Wash down waste must be filtered before release..
3. Contaminated Land and Acid Sulfate Soils

• *Machinery is appropriately cleaned, degreased and serviced prior to use at the site.*
• *Spill kits maintained onsite during the construction period and employees trained how to use spill kits.*
• *Visual monitoring of local drainage systems within the site is to be undertaken during rainfall events to identify any potential spills or deficient controls.*
• *Contractors and BSC shall monitor weather forecasts daily and review construction activities to ensure that:*
  ○ *Works are scheduled and planned to consider significant rain/flood events; and*
  ○ *The works do not negatively impact emergency evacuation routes where possible.*
• *A project specific Dewatering Management Plan shall be prepared in accordance with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018).*

Safeguards/Mitigation Measures
• *Construction dewatering taking over 3 megalitres of groundwater through an aquifer interference activity per authorised project per water year requires a water access licence under Section 92 of the Water Management Act 2000 prior to undertaking dewatering activities.*
4. Water Quality and Hydrology

• *Machinery is appropriately cleaned, degreased and serviced prior to use at the site.*
• *Spill kits maintained onsite during the construction period and employees trained how to use spill kits.*
• *Visual monitoring of local drainage systems within the site is to be undertaken during rainfall events to identify any potential spills or deficient controls.*
• *Contractors and BSC shall monitor weather forecasts daily and review construction activities to ensure that:*
  ○ *Works are scheduled and planned to consider significant rain/flood events; and*
  ○ *The works do not negatively impact emergency evacuation routes where possible.*
• *A Dewatering Management Plan is recommended for the activity to address excavations that will encounter inflows during construction. Any dewatering undertaken will ensure that no discharged water leaves the site or is of a quality that will detrimentally impact areas of biodiversity value.*

5. Biodiversity
• *Minimise the extent of clearing wherever possible.* • *Prior to works the limits of clearing must be clearly defined by bunting or temporary fencing and these areas designated as 'no go' zones.* • *A pre-clearing survey must be completed by an ecologist or spotter-catcher prior to vegetation clearance in the event that fauna are present. Surveys may be required over several days depending on the project timing and program. The project ecologist shall advise the project superintendent on any measures taken to avoid any fauna features or on measures necessary to avoid any active nests/dreys or other features. Consideration of avoiding impacting the brush turkey mound will be necessary with regarding to breeding times and the project timeline.* • *Branches and woody debris within the clearing footprint shall be removed and relocated into adjacent vegetation/habitat) as part of the pre-clearing survey.* • *For all tree removal completed, material shall be chipped and mulch used in landscaping or sprayed into adjacent vegetation (or removed from site as last resort if necessary).* • *Weed hygiene measures must be practiced for the duration of the project to ensure propagules are not spread during clearing works.* • *Any post-works landscaping must utilise endemic species reflective of the vegetation community present. It is recommended that landscape plantings include Stinking Laurel as a feature species and plants are sourced locally or established from seed collected and grown up from trees in the locality.* • *A (temporary) fauna crossing sign should be installed for at least 12 months once the road is opened. The signs should be installed on either side of the new road and state: "Caution: fauna crossing" (or words of similar intention). BSC should consider the installation of traffic calming devices which may also be helpful in slowing traffic speeds which may further reduce fauna impacts.*

Safeguards/Mitigation Measures
• *WIRES are to be contacted on 1300 094 737 in the unlikely event that fauna become harmed during works.* • *To mitigate the vegetation clearing associated with the proposed development and achieve no net loss of biodiversity, compensatory planting is recommended generally in accordance with the Byron Shire Development Control Plan 2014 Chapter F1 Tree and Vegetation Management.* • *Retained native vegetation (individual trees and copses of vegetation) proximate to works which are not subject for removal are to be clearly fenced and managed during construction activities in accordance with the Australian Standard 'AS 4970 Protection of Trees on Development Sites'.*
6. Aboriginal Cultural Heritage

• *During the ground excavation activities the following will be undertaken.*
  ○ *Council to consider and determine if it is necessary for cultural site monitoring to be appointed during ground breaking work;*
  ○ *Timely notice shall be provided to TBLALC and Arakwal prior to commencing works*
• *CEMP is to include Byron Shire Council's Unexpected Finds and Stop Work Protocols (provided at Appendix H of the REF).*

7. Historic Heritage
• *In the event of an unexpected find, works will not recommence until signed authority is received from BSC and any necessary permits and/or approvals are obtained.* • *The Construction Contractor is to ensure all staff on site are aware of the unexpected finds protocol contained in the CEMP.*
8. Noise and Vibration

• *Construction working hours will be restricted to the normal daytime construction hours as specified by the EPA being:*
  ○ *7 am to 6 pm Monday to Friday.*
  ○ *8 am to 1 pm Saturdays.*
  ○ *No works will be undertaken on Sundays or Public Holidays.*
• *Works may be undertaken outside these hours where:*
  ○ *The delivery of materials is required outside these hours;*
  ○ *It is required in an emergency to avoid the risks to public safety, damage to property and/or to prevent environmental harm;*
  ○ *Receivers likely to be affected by the works are notified in writing of the timing and duration of these works at least 24 hours prior to the commencement of works (except for emergency work).*
• *Notification of any receivers within 100 m of the works (letterbox drop or equivalent) is recommended including the anticipated duration of such works at least two weeks prior to undertaking the works. All notified receivers will be provided with a contact telephone number for any complaints/ updates associated with the proposed works.*
• *Noise complaints will be recorded, including suitable identification/ description of the noise source (e.g. continual/ impulsive) and general location of the complaint. Any noise complaints will be investigated and actioned as required.*

Safeguards/Mitigation Measures

• *All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include:*
  ○ *All relevant project-specific and standard noise mitigation measures.*
  ○ *Permissible hours of work.*
  ○ *Any limitations on high noise generating activities.*
  ○ *Location of nearest receivers.*
  ○ *Designated loading/ unloading areas and procedures.*
  ○ *Escalation protocols for noise complaints.*
• *BSC may as a conservative measure, prepare building dilapidation reports for any buildings or structures within 20m of the works alignments..*

9. Air Quality
• *Adjacent receivers with potential to experience impacts associated with dust and other airborne particles due to works are to be notified of any potential air quality impacts prior to undertaking the works.* • *Vehicles and vessels transporting waste or other materials that may produce odours or dust are to be covered during transportation.* • *Disturbed surfaces and stockpiles will be wetted down or covered with geotextile fabric during high wind conditions to prevent significant dust generation, as required.* • *All plant and machinery will be serviced at regular intervals to minimise exhaust emissions.* • *Vehicles will be switched off when not in use.*
10. **Traffic *and Access***
• *Where works occur next to live traffic a Traffic Control Plan (TCP) shall be prepared by a qualified person and implemented for the works in accordance with the requirements of SafeWork NSW. Licensed traffic controllers will assist with traffic control during the Project.* • *Where possible, current traffic movements will be maintained during the works.* • *Regard to public safety will be maintained at all times and appropriate signage will be erected and details will be confirmed by appropriate Council personnel responsible for site safety during the activity.* • *Any traffic delay notifications will be issued by Council at least two weeks prior to commencement of works. Notification will be made via Council website and potable variable messages sign (VMS) located along the affected public road.* • *BSC will regularly consult with affected properties along Gilmore Crescent and Tennyson Street regarding any potential property access impacts associated with the activity.*
11. Waste and Chemical Management
• *Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day using skip bins.* • *Work to be undertaken in accordance with the Protection of the Environment Operations (Waste) Regulation 2014.*

Safeguards/Mitigation Measures

• *Waste materials are to be categorised in accordance with the NSW EPA Waste Classification Guidelines and transferred to a licensed waste facility for the receipt of such waste.*
• *BSC shall ensure that all suitable spoil and excavated road materials are reused in accordance with the Protection of the Environment Operations (Waste) Regulation 2014 including (but not limited to):*
  ○ *The excavated public road material order and exemption 2014*
  ○ *The reclaimed asphalt pavement order and exemption 2014*
  ○ *The excavated natural material order and exemption 2014*
  ○ *Virgin Excavated Natural Material (VENM) as defined in Schedule 1 of the Protection of the Environment Operations Act 1997.*
  ○ *The mulch order and exemption 2016.*

12. Visual Amenity & Landscape
• *Final design for street lighting will comply with AS4282:2019 Obtrusive Effects of Outdoor Lighting to mitigate impact on adjoining bushland and properties* • *Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day using waste collection bins.* • *Upon completion of construction, work areas and waste stockpiles will be removed, and the activity area grassed / stabilised and cleared of all rubbish and materials.*
13. Socio-economic
• *Contractors/ workers would be mindful of the needs of the local community.* • *In accordance with the Work Health and Safety Act 2011, workers would be provided with appropriate safety clothing and equipment. Supervisory staff and any visitors to the work area would also be required to wear protective clothing. Works personnel would be provided with or expected to have protective equipment and appropriate training.* • *Prior to undertaking any excavation works all underground services will be clearly located. Any potential services interruptions shall be communicated to the relevant services authorities to enable flow on notifications to any affected services customers*
***14.* Red Imported Fire Ants**

• *Prior to the use of materials and equipment that has travelled through or from a biosecurity zone, Project Managers are to ensure that contractors supply the necessary certificates for any of the materials and equipment. The biosecurity zones are shown at the NSW DPI Alert https://www.dpi.nsw.gov.au/dpi/bfs/insect-pests/rifa*
• *Moving fire ant carriers from the fire ant infested area of Queensland into NSW (the Emergency Zone) must:*
  ○ *Follow the requirements as specified for each fire ant carrier in part 2 of the emergency Orderhttps://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants*
  ○ *Obtain an approved biosecurity certificate for fire ant carrier materials.*
  ○ *Complete the record of movement Declaration form prior to the carriers moving into NSW*
• *Moving fire ant carriers out of the NSW fire ant movement control area in South Murwillumbah into the rest of NSW (the Emergency Zone) you must follow the requirements*

Safeguards/Mitigation Measures

specified in Part 3 of the Emergency Order. https://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants.
• *If red imported fire ants are suspected at or adjoining the works areas, stop work immediately, notify DPI of the issue and commence the following:*
  ○ *Suspicious sightings of red imported fire ants or their mounds that have been identified within a site must be reported to NSW Department of Primary Industries immediately on 1800 680 244 or via their online form https://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants*
  ○ *If red imported fire ants are suspected, do not disturb the ants or nests and make records of the ants and nest (including photographic record) as outlined in the NSW DPI Alert https://www.dpi.nsw.gov.au/biosecurity/forms/report-exotic-ants* https://www.dpi.nsw.gov.au/biosecurity/insect-pests/fire-ants
• *If red imported fire ants are suspected at or adjoining the works areas, works may not commence until:*
  ○ *DPI will work with the National Fire Ants Eradication Program to search the surrounding areas, treat the ants, and stop their spread, at no cost to the owners or occupiers.*
  ○ *A temporary requirement to only move certain materials and items off the property under permitted conditions could be put in place while the ants are controlled.*
  ○ *The ants are treated and monitored until it is clear they have been eradicated.*

15. **Cumulative Impact**
• It is recommended that BSC and the contractor develop the works schedules to consider the nearby construction projects to minimise any cumulative impacts on local amenity.

7 Conclusion

An assessment of relevant legislation and environmental planning instruments has confirmed the proposed Activity is permitted without development consent in accordance with clause 2.109 and Clause 2.137 (1) of T&I SEPP.

An environmental assessment of the Activity has been undertaken in accordance with Part 5 of the *EP&A Act*. For this activity, BSC is both a public authority proponent (EP&A Act s.5.3) and the determining authority (EP&A Act s.5.1). The REF has been prepared in accordance with Section 171 of the *EP&A Regulation*.

This environmental assessment has also identified the activity is not a prescribed activity, and therefore does not require an Environmental Impact Statement (EIS) in accordance with Section 5.7 of the *EP&A Act*, and is not likely to significantly affect threatened species, and therefore does not require a Species Impact Statement (SIS) in accordance with Section 7.8 of the *Biodiversity Conversation Act 2016*. The activity is also unlikely to affect Commonwealth land or have an impact on any matters of national environmental significance.

Overall, it is considered that having regard to the relevant tests under the NSW and Commonwealth planning frameworks, the Activity will not result in any significant impacts and should be supported subject to the reasonable and relevant safeguards recommended in this REF.

8 REF Determination Page

8.1 Author Declaration

This REF provides a true and fair review of the activity in relation to its likely effects on the environment. It addresses to the authors best attempt possible all matters affecting or likely to affect the environment as a result of the project and provides information to determine whether there is likely to be a significant impact on the environment as a result of the Project.

This REF identifies that significant impacts to the environment are highly unlikely. Together with the identified mitigation methods under this report, these safeguards will ensure appropriate environmental outcomes are achieved when undertaking the proposed activity.

Assessor Declaration	
Project Name:	Tennyson Street Extension REF
Assessor Name:	Sean Cochran
Position:	Senior Environmental Planner, Planit Consulting
Phone:	02 6687 4666
Signature:	
Date	11/06/2025

8.2 Determiner declaration & approval

BSC is required to review the document and determine the Project. By signing below BSC has indicated that it has considered that the project is unlikely to have a significant environmental impact provided the mitigation measures outlined in this REF are followed and therefore an Environmental Impact Statement or a Species Impact Statement is not required.

Determiner declaration & approval	
Determiner Name:	Phillip Holloway
Company:	Byron Shire Council
Position:	Director Infrastructure Services
Phone:	02 6626 7000
Signature:	
Date:	17/06/2025

References

Australian Government, Department of the Environment and Energy, Protected Matters Search Tool, Available at: http://www.environment.gov.au/epbc/protected-matters-searchtool (Accessed: 2025)

NSW Environment Protection Authority (2023), Contaminated Lands Register, Available at: http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx (Accessed: 2025)

NSW Office of Environment and Heritage (2023), BioNet ATLAS of NSW wildlife, Available at: http://www.bionet.nsw.gov.au/ (Accessed: 2025)

NSW Office of Environment and Heritage (OEH), Aboriginal Heritage Information System (AHIMS), Available at: http://www.environment.nsw.gov.au/licences/AboriginalHeritageInformationManagementSystem.htm (Accessed: 2025)

Heritage NSW, State Heritage Inventory, Available at: https://www.heritage.nsw.gov.au/search-for-heritage/search-for-nsw-heritage/ (Accessed: 2025)

NSW SEED Portal, SEED Mapping Available at: https://www.seed.nsw.gov.au/ Accessed: 2025)`

National Native Title Tribunal Register of Native Title Claims Available at http://www.nntt.gov.au/searchRegApps/NativeTitleRegisters/Pages/Search-Register-of-Native-Title-Claims.aspx Accessed: 2025)

Appendix A – Concept Design

N

100mm AT ORIGINAL SIZE

TENNYSON STREET EXTENSION
BYRON BAY NSW
DETAILED DESIGN

DRAWING REGISTER		
DRAWING NUMBER	TITLE	REVISON
1000	COVER SHEET & DRAWING REGISTER	00
1010	GENERAL NOTES & LEGEND	00
1100	SEDIMENT AND EROSION CONTROL PLAN	00
1200	BULK EARTHWORKS PLAN	00
1300	ROAD - LAYOUT PLAN	00
1310	ROAD - LONGITUDINAL SECTION	00
1320	ROAD - CROSS SECTIONS - SHEET 1 OF 3	00
1321	ROAD - CROSS SECTIONS - SHEET 2 OF 3	00
1322	ROAD - CROSS SECTIONS - SHEET 3 OF 3	00
1400	CONSTRUCTION DETAILS	00
1500	KERB SETOUT PLAN	00
1600	DRAINAGE - LAYOUT PLAN	00
1610	DRAINAGE - LONGITUDINAL SECTION - SHEET 1 OF 2	00
1611	DRAINAGE - LONGITUDINAL SECTION - SHEET 2 OF 2	00
1700	SIGNAGE AND LINEMARKING PLAN	00

LOCALITY PLAN (SOURCE: NEARMAPS, 2022)
NOT TO SCALE

FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
00	IFC	27/09/24	NP	NP	CG	CG

SCALES: NOT TO SCALE

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APPROVED BY: CESAR GIRALDO

DATE: 27/09/24

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CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: TENNYSON STREET EXTENSION

DRAWING TITLE: COVER SHEET

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J5772	1000	00

CAD FILE: C:\12DS\DATA\PLANITSYNJ7572 - SANDHILLS ESTATE_786\7 - ENGINEERING\7.4 DRAFTING\J7572 - GILMORE CRESCENT - DETAIL PLAN STAGE 2.DWG PLOTTED BY: NICK.PLETTING PLOT DATE: 27/09/2024 1:16:17 PM

100mm AT ORIGINAL SIZE

GENERAL

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE FOLLOWING DOCUMENTS:
   - OTHER PROVIDED ENGINEERING DRAWINGS;
   - TECHNICAL SPECIFICATIONS;
   - SUPPLEMENTARY SPECIFICATIONS;
   - WRITTEN INSTRUCTIONS.
2. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT SPECIFICATION FOR THE WORKS TOGETHER WITH THE REQUIREMENTS OF ALL THE RELEVANT CODES OF PRACTICE REFERRED TO THEREIN AND THE REQUIREMENTS OF BYRON SHIRE COUNCIL AND NORTHERN RIVERS LOCAL GOVERNMENT STANDARDS AND SPECIFICATIONS.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND PROVISION OF ANY TEMPORARY BRACING, PROPPING ETC. TO DRAINAGE PIPES DURING CONSTRUCTION. STRUCTURES SHALL BE MAINTAINED IN A STABLE POSITION AND NO PART SHALL BE OVERSTRESSED.
4. ALL LOCATIONS, ORIENTATION AND LEVELS SHALL BE VERIFIED ON SITE BEFORE COMMENCING ANY WORK. DISCREPANCIES SHALL BE REFERRED TO THE SITE SUPERINTENDENT.
5. DO NOT OBTAIN DIMENSIONS FROM SCALING.
6. NATURAL SURFACE LEVELS ON THE DRAWINGS ARE INDICATIVE ONLY.
7. ANY PERMITS AND APPROVALS REQUIRED FOR CONSTRUCTION OF PERMANENT OR TEMPORARY WORKS SHALL BE OBTAINED BY THE CONTRACTOR.
8. NORTHERN RIVERS LOCAL GOVERNMENT STANDARD DETAILS ARE TO BE ADOPTED UNLESS STATED OTHERWISE.
9. THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION UNLESS APPROVED ('STAMPED') BY COUNCIL. STAMPED PLANS ARE TO BE KEPT ON SITE AT ALL TIMES
10. ANY DEVIATIONS FROM THESE PLANS ARE TO BE APPROVED BY THE ENGINEER.

SERVICES

1. THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE DETERMINED ON SITE BY THE CONTRACTOR, NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.
2. THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES AND PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

EROSION AND SEDIMENT CONTROL

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE EROSION AND SEDIMENT CONTROL PLAN.
2. ALL CONTROL MEASURES SHALL BE IN ACCORDANCE WITH "NORTHERN RIVERS LOCAL GOVERNMENT DEVELOPMENT DESIGN SPECIFICATION D7 EROSION CONTROL AND STORMWATER MANAGEMENT".
3. SEDIMENT AND EROSION CONTROL MEASURES ARE INDICATIVE ONLY AND SHALL BE CONFIRMED BY THE CONTRACTOR.
4. THE CONTRACTOR SHALL INFORM ALL STAFF AND SUB-CONTRACTORS OF THEIR OBLIGATIONS UNDER THE EROSION AND SEDIMENT CONTROL PLAN.
5. CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EACH SITE DISTURBANCE.
6. ALL WORKS ARE TO BE INSPECTED, AND MAINTAINED WHERE NECESSARY, ON A WEEKLY BASIS AND AFTER EACH RAIN EVENT.
7. ADEQUATE MEASURES SHALL BE TAKEN TO PREVENT DUST FROM AFFECTING THE AMENITY OF THE NEIGHBOURHOOD DURING CONSTRUCTION. WATER SITE AS REQUIRED TO PREVENT DUST GENERATION. USE TEMPORARY SPRINKLERS AS REQUIRED.
8. ALL WORKS ON SITE SHALL STOP WHEN WIND SPEEDS REACHES 35km/h.
9. CLEANING OF FOOTPATHS AND ROADWAYS SHALL BE CARRIED OUT REGULARLY
10. TURF AND VERGE AREAS TO BE REINSTATED WHEN DISTURBED DURING CONSTRUCTION.
11. STOCKPILES TO BE AWAY FROM OVERLAND FLOW PATHS AND TO BE SURROUNDED BY A SEDIMENT FENCE.

EARTHWORKS

1. ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH AS3798 AND SUPERVISION TO LEVEL 1 SHALL BE SUPPLIED BY THE CONTRACTOR.
2. TOPSOIL AND OTHER ORGANIC MATTER IS TO BE STRIPPED FROM GROUNDWORK AREAS PRIOR TO COMMENCING GROUNDWORKS AND SHALL BE STOCKPILED ON SITE. EARTH STOCKPILES SHALL BE SUITABLY PROTECTED FROM EROSION AND WEED INFESTATION BY COVERING WITH WEED MAT OR OTHER MEANS. RESPREAD TOPSOIL TO FINISHED SURFACE LEVELS AND VEGETATE TO SPECIFICATION PRIOR COMPLETION. EXCESS TOPSOIL TO BE REMOVED FROM SITE.
3. THE USE OF VIBRATORY COMPACTORS IS NOT PERMITTED ON SITE.
4. NON SUITABLE SITE WON MATERIAL (E.G. SILTY SANDS, REACTIVE, DISPERSIBLE MATERIAL) ARE NOT TO BE USED WITHIN ENGINEERING FILL UNLESS ASSESSED AND CERTIFIED AS SUITABLE FOR USE BY THE LEVEL 1 GEOTECHNICAL ENGINEER.
5. ALL IMPORTED (IF ANY) FILL IS TO BE 'CLEAN' AND FREE OF ANY CONTAMINATION.
6. SUITABILITY AND TREATMENT OF ALL BATTERS STEEPER THAN 1 IN 4 TO BE CONFIRMED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION. THE GEOTECHNICAL ENGINEER SHALL PROVIDE THE APPROPRIATE LEVEL OF SUPERVISION DURING CONSTRUCTION IN ACCORDANCE WITH AS3798 AND CERTIFY THE COMPLETED WORKS PRIOR TO THE REMOVAL OF ANY TEMPORARY STABILISATION MEASURES.
7. RETAINING WALLS SHALL BE SUBJECT TO STRUCTURAL DESIGN OR TO THE REQUIREMENTS OF THE SUPPLIER OF PROPRIETY RETAINING PRODUCTS.

ROADWORKS

1. NOTWITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS ALL WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH BYRON SHIRE COUNCIL STANDARD SPECIFICATIONS AND DRAWINGS.
2. GEOTECHNICAL TEST RESULTS ARE TO BE FORWARDED TO THE SUPERINTENDENT PRIOR TO FINAL BOXING. TESTS SHALL INCLUDE SOAKED CBR AND/OR OTHER TESTS AS REQUESTED BY THE SUPERINTENDENT. THESE TESTS SHALL BE USED TO CONFIRM THE PAVEMENT DESIGN SHOW ON THESE DRAWINGS.
3. WORK TO ANY SERVICES SHOULD BE DONE IN CONSULTATION WITH THE APPROPRIATE SERVICE PROVIDER.

PAVEMENTS

1. GRANULAR PAVEMENT MATERIAL TO BE IN ACCORDANCE WITH ROADS AND MARITIME SERVICES NSW CONSTRUCTION SPECIFICATIONS AND ALL DOCUMENTS REFERENCED WITHIN THESE SPECIFICATIONS.
2. THE PAVEMENT SEAL IS TO BE IN ACCORDANCE WITH ROADS AND MARITIME SERVICES NSW CONSTRUCTION SPECIFICATIONS AND ALL DOCUMENTS REFERENCED WITHIN THESE SPECIFICATIONS.
3. SAMPLING SHALL BE CARRIED OUT IN ACCORDANCE WITH NRLG & TfNSW GUIDELINES.
4. FINAL PAVEMENT DESIGN IS SUBJECT TO RECEIPT OF THE GEOTECHNICAL TEST RESULTS AND MAY RESULT IN AN AMENDMENT TO THE PAVEMENT DESIGN SHOWN ON THIS DRAWING.
5. FOOTPATHS AND DRIVEWAYS TO BE IN ACCORDANCE WITH NORTHERN RIVERS LOCAL GOVERNMENT CONSTRUCTION SPECIFICATIONS.

DRAINAGE

1. ALL DRAINAGE STRUCTURES ARE TO BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING DOCUMENTS:
   - BYRON SHIRE COUNCIL DRAWINGS AND SPECIFICATIONS;
   - ANY MANUFACTURER'S STANDARD DRAWINGS AND SPECIFICATIONS.
2. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT SPECIFICATION FOR THE WORKS TOGETHER WITH THE REQUIREMENTS OF ALL THE RELEVANT CODES OF PRACTICE REFERRED TO THEREIN AND THE REQUIREMENTS OF THE STATUTORY AUTHORITIES WHERE APPLICABLE.
3. STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL LOADS ONLY. THE CONTRACTOR IS RESPONSIBLE FOR THE ASSESSMENT OF CONSTRUCTION LOADS AND PROVISIONS OF ANY TEMPORARY BRACING, PROPPING ETC. REQUIRED DURING CONSTRUCTION. STRUCTURES SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED.
4. PRECAST REINFORCEMENT CONCRETE PIPES ARE TO BE MANUFACTURED IN ACCORDANCE WITH AS 4058 AND AS 1992.
5. ALL STORMWATER PIPES SHALL BE CLASS '3' RCP. U.N.O.
6. ALL PIPES UP TO AND INCLUDING Ø600 ARE TO BE RUBBER RING JOINTED. ALL PIPES ABOVE Ø600 ARE TO BE FLUSH JOINTED U.N.O.
7. EXISTING STORMWATER DRAINAGE PIPES AND MANHOLES WITHIN THE LIMIT OF WORK SHALL BE PROTECTED, REMOVED OR MODIFIED AS SPECIFIED.
8. WHERE A CONNECTION IS MADE TO AN EXISTING DRAINAGE PIPE OR PIT, THE LEVEL OF THAT ELEMENT MUST BE SURVEYED PRIOR TO CONSTRUCTION. THE SURVEYED LEVELS SHALL BE PROVIDED TO THE SITE SUPERINTENDENT TO CONFIRM THE CONNECTION AND LEVELS PRIOR TO CONSTRUCTION.
9. BACKFILL AND BEDDING TO PIPE TO BE IN ACCORDANCE WITH BYRON SHIRE COUNCIL STANDARD DRAWINGS AND SPECIFICATIONS.
10. UNSUITABLE FOUNDING MATERIAL FOR PIPES AND STRUCTURES SHALL BE REMOVED OR IMPROVED IN ACCORDANCE WITH BYRON SHIRE COUNCIL SPECIFICATIONS.
11. ALL TRENCH BACK FILL MATERIAL UNDER THE PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.
12. STEEL GRATES AND FRAMES ARE TO BE FABRICATED FROM MILD STEEL AND HOT DIP GALVANISED. ALL GRATES ARE TO BE CLASS D U.N.O. AND BICYCLE SAFE IN ACCORDANCE WITH AS 3996 U.N.O.
13. GRATE SUPPORT TO BE CONSTRUCTED LEVEL TO ENSURE THAT THE GRATE DOES NOT ROCK AFTER INSTALLATION.
14. ALL LEVELS ARE APPROXIMATE ONLY AND ARE SUBJECT TO FULL DETAIL SURVEY OF THE EXISTING STRUCTURE.

CONCRETE

1. COMPLY WITH AS 3600.
2. DESIGN AND CONSTRUCT FORMWORK IN ACCORDANCE WITH AS 3610.
3. PROVIDE QUALITY OF FINISHES OF FORMED SURFACES IN ACCORDANCE WITH AS 3610 AND AS FOLLOWS U.N.O. ON DRAWINGS:
   - EXPOSED SURFACES - CLASS 3;
   - CONCEALED SURFACES - CLASS 4;
   - IN CONTACT WITH GROUND - CLASS 5.
4. THE LISTED SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES. PROVIDE CHAMFERS, FILLETS, REGLETS AND DRIP GROOVES AS SHOWN ON THE STRUCTURAL DRAWINGS.
5. DO NOT MAKE ANY PENETRATIONS OR CHASES OR EMBED ANY ITEMS OTHER THAN THOSE SHOWN IN THE STRUCTURAL DRAWINGS WITHOUT APPROVAL OF THE ENGINEER.
6. FORM CONSTRUCTION JOINTS ONLY WHERE APPROVED BY THE ENGINEER.
7. REINFORCEMENT SYMBOLS:
   - "S" DENOTES GRADE 250S HOT ROLLED DEFORMED BAR TO AS 1302;
   - "Y" DENOTES GRADE 400Y HOT ROLLED DEFORMED BAR TO AS 1302;
   - "R" DENOTES GRADE 250R HOT ROLLED PLAIN BAR TO AS 1303;
   - "W" DENOTES HARD-DRAWN PLAIN WIRE TO AS 1303;
   - "RF" & "L" DENOTES HARD DRAWN RIBBED WIRE FABRIC TO AS 1304;
   - "N" DENOTES GRADE 500N HOT ROLLED DEFORMED BAR TO AS 1302.

   THE NUMBER FOLLOWING THE BAR SYMBOL IS THE BAR DIAMETER IN mm.
8. PROVIDE COVER TO REINFORCEMENT AS FOLLOWS:

ELEMENT	COVER
PAVEMENTS	40mm TOP
CONCRETE IN CONTACT WITH GROUND	65mm

9. SUPPORT REINFORCEMENT IN ITS CORRECT POSITION DURING CONCRETING BY APPROVED BAR CHAIRS, SPACERS OR SUPPORT BARS SUITABLE FOR THE EXPOSURE CONDITIONS.
10. LAP BAR REINFORCEMENT AS FOLLOWS U.N.O. ON DRAWINGS:
    - N12 550mm
    - N16 750mm
    - N20 950mm
    - N24 1100mm
    - N28 1300mm
    - N32 1500mm
    - N36 1700mm
    - N42 1900mm
11. BARS WITH MORE THAN 300mm OF CONCRETE UNDER THEM SHALL HAVE LAPS 1.25 TIMES THESE LENGTHS.
12. LAP MESH REINFORCEMENT BY ONE COMPLETE MESH.
13. DO NOT WELD OR SITE BEND REINFORCEMENT UNLESS SHOWN IN THE DRAWINGS OR OTHERWISE SPECIFIED BY THE ENGINEER.
14. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
15. PROVIDE PREMIX CONCRETE FOR EACH ELEMENT AS FOLLOWS:

ELEMENT	GRADE	MAX AG	SLUMP
PAVEMENTS	N32	20mm	80mm
MASS CONCRETE	N20	20mm	80mm

16. SAMPLE TEST AND ASSESS CONCRETE COMPLIANCE IN ACCORDANCE WITH PROJECT ASSESSMENT OF STRENGTH GRADE TO SECTION 20 OF AS 3600.
17. THE CONCRETE SHALL BE COMPACTED USING HIGH-FREQUENCY VIBRATORS.
18. ALL SLABS SHALL BE PLACED AT THE SAME TIME AS BEAMS OF WHICH THEY FORM PART.
19. TRIM ALL PENETRATIONS LESS THAN 300mm WITH 2 N16 BARS EACH SIDE, EACH FACE AND DISPLACE REINFORCEMENT EACH SIDE.
20. CURING OF ALL CONCRETE SURFACES SHALL COMMENCE IMMEDIATELY AFTER SURFACES ARE FINISHED AS SPECIFIED AND SHALL CONTINUE FOR A MINIMUM OF 7 DAYS.
21. ADMIXTURES SHALL NOT BE USED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.
22. CEMENT SHALL BE TYPE A NORMAL CLASS PORTLAND CEMENT U.N.O.
23. MAXIMUM 56 DAY SHRINKAGE STRAIN TO BE 65μ WHEN TESTED IN ACCORDANCE WITH AS 1012.

LEGEND - PROPOSED

- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PATH
- PROPOSED CONCRETE CROSSOVER
- PROPOSED GRAVEL TRACK
- PROPOSED PAVEMENT REMOVAL, 100mm THICK TOPSOIL AND HYDROSEEDING
- PROPOSED DRAINAGE PIPE — D —
- PROPOSED GRATED PIT
- PROPOSED JUNCTION PIT
- PROPOSED KERB
- PROPOSED ROAD RESERVE BOUNDARY

LEGEND - EXISTING

- EXISTING WATER MAIN — W —
- EXISTING OVERHEAD POWER — E — E —
- EXISTING UNDERGROUND POWER — E —
- EXISTING TELECOMMUNICATIONS CABLE — T —
- EXISTING STORMWATER — SW —
- EXISTING SEWER RISING MAIN — SRM —
- EXISTING SEWER GRAVITY MAIN — S —
- EXISTING CONTOUR — 5.00 —
- EXISTING TREE & TRUNK DIAMETER (mm) Ø150
- EXISTING TREE REMOVED (STAGE 1 WORKS)
- EXISTING TREE TO BE REMOVED (STAGE 2)

FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
00	IFC	27/09/24	NP	NP	CG	CG

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APPROVED BY: CESAR GIRALDO

DATE: 27/09/24

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

PROJECT: TENNYSON STREET EXTENSION

DRAWING TITLE: GENERAL NOTES & LEGEND

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
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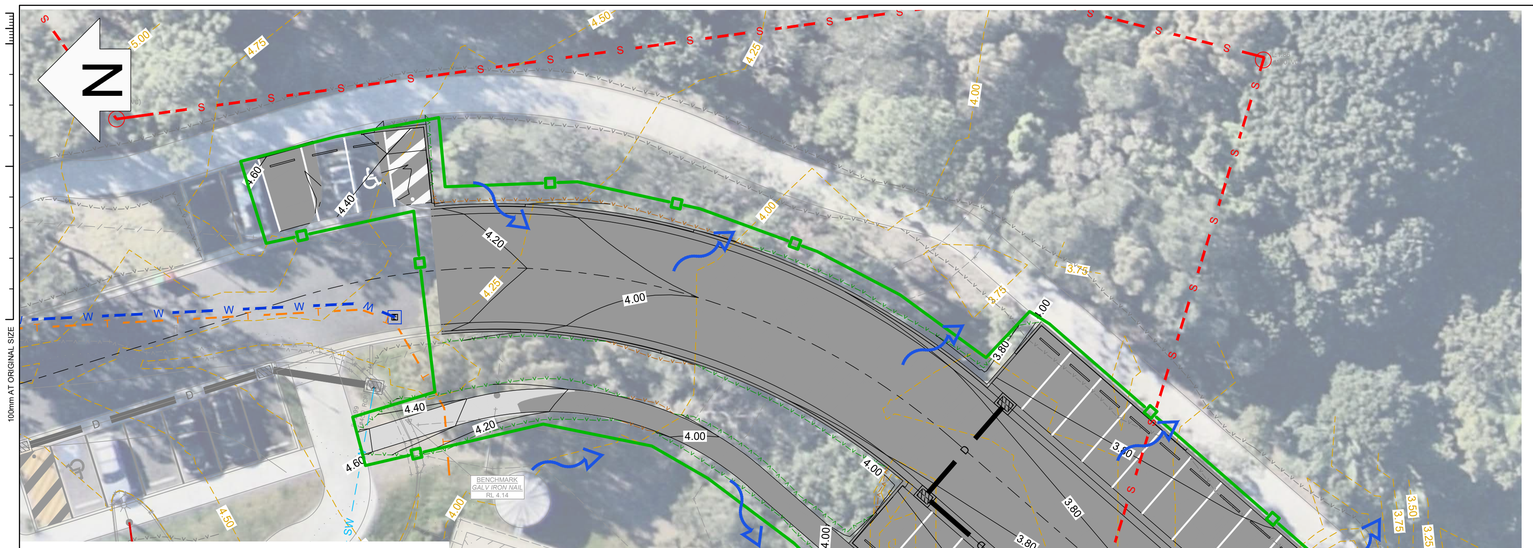
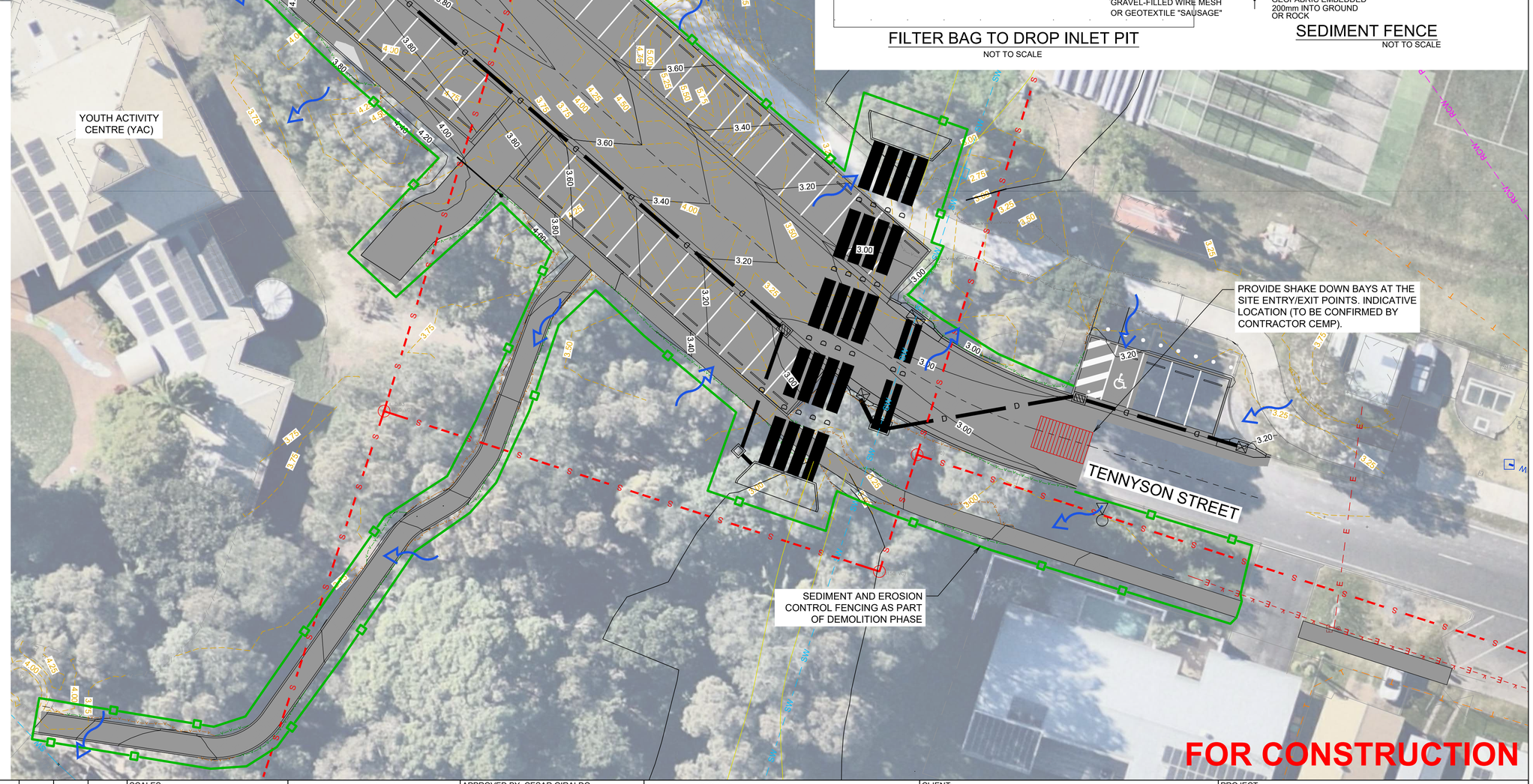
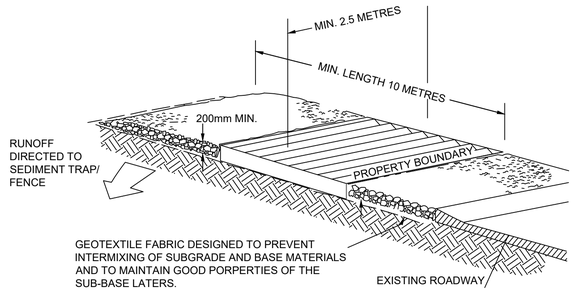
CAD FILE: C:\12DS\DATA\PLANITSYNJ7572 - SANDHILLS ESTATE_786\7 - ENGINEERING\7.4 DRAFTING\J7572 - GILMORE CRESCENT - DETAIL PLAN STAGE 2.DWG PLOTTED BY: NICK.PLETTING PLOT DATE: 27/09/2024 1:16:16 PM

100mm AT ORIGINAL SIZE







SHAKE DOWN AREA

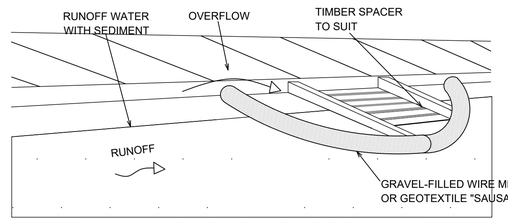
NOT TO SCALE

CONSTRUCTION NOTES

1. COMPACT SUBGRADE
2. COVER WITH NEEDLE PUNCHED GEOTEXTILE.
3. CONSTRUCT 200mm THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30mm AGGREGATE. MINIMUM LENGTH OF 10m AND MINIMUM WIDTH OF 2.5m.GEOTEXTILE MAY BE A WOVEN OR NEEDLE PUNCHED PRODUCT WITH A MINIMUM CBR BURST STRENGTH (AS3706.4-90) of 2500 N.
4. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP.

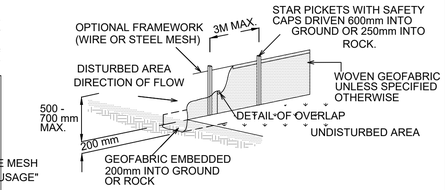
NOTE

ALL SLOPES HIGHER THAN 1V:4H TO BE CHECKED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER.



FILTER BAG TO DROP INLET PIT

NOT TO SCALE



SEDIMENT FENCE

NOT TO SCALE

DIAL BEFORE YOU DIG
www.1100.com.au

WARNING

BEWARE OF ABOVE GROUND SERVICES

ANY EXCAVATION IN THE VICINITY OF POWER POLES TO BE IN ACCORDANCE WITH THE REGULATIONS OF THE RELEVANT ELECTRICAL AUTHORITY.

WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE DETERMINED BY THE CONTRACTOR ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN ON THIS PLAN.

NOTES:

1. SERVICE LOCATIONS ARE TO BE CONFIRMED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF THE WORKS.
2. THE CONTRACTOR SHALL BE ULTIMATELY RESPONSIBLE FOR CONFIRMATION OF THE LOCATION OF UNDERGROUND SERVICES PRIOR TO CARRYING OUT THE WORKS.
3. LOCATIONS OF SEDIMENT AND EROSION CONTROL DEVICES ARE INDICATIVE ONLY AND ARE TO BE CONFIRMED IN THE CONTRACTOR'S CEMP PRIOR TO CONSTRUCTION.
4. SEDIMENT AND EROSION CONTROL MEASURES TO BE IN ACCORDANCE WITH PLANIT'S STORMWATER MANAGEMENT PLAN; LANDCOM'S 'BLUE BOOK'; AND COUNCIL'S SPECIFICATIONS
5. SEDIMENT AND EROSION CONTROL DETAILS SHOWN ON THE PLAN ARE NOT TO SCALE.

LEGEND

- STORMWATER FLOW DIRECTION
- SILT FENCE
- VEHICLE SHAKEDOWN

FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
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SCALES:
0 2 4 8 12
Full Size 1:200 ; Half Size 1:400
Scale (m)

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

PROJECT: TENNYSON STREET EXTENSION

DRAWING TITLE: SEDIMENT AND EROSION CONTROL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J5772	1100	00

CAD FILE: C:\12DS\DATA\PLANITSYNJ7572 - SANDHILLS ESTATE_786\7 - ENGINEERING\7.4 DRAFTING\J7572 - GILMORE CRESCENT - DETAIL PLAN STAGE 2.DWG PLOTTED BY: NICK.PLETTING PLOT DATE: 27/09/2024 1:16:24 PM

100mm AT ORIGINAL SIZE

BULK EARTHWORKS NOTES

- EARTHWORKS ELEVATIONS ARE CALCULATED FROM EXISTING SURVEYED SURFACE AND PROPOSED BOXING. CUT FILL QUANTITIES FOR PROPOSED CULVERTS IS NOT INCLUDED IN VOLUMES.

CUT/FILL VOLUMES

TOTAL CUT (m^3)	1054
TOTAL FILL (m^3)	11
BALANCE (m^3)	1043 CUT

Surface Analysis: Elevation Ranges

COLOUR	LOWER LIMIT (m)	UPPER LIMIT (m)
	-2.00	-1.40
	-1.40	-1.20
	-1.20	-1.00
	-1.00	-0.80
	-0.80	-0.60
	-0.60	-0.40
	-0.40	-0.20
	-0.20	0.00
	0.00	0.20
	0.20	0.40
	0.40	0.60
	0.60	0.80
	0.80	1.00
	1.00	1.50

YOUTH ACTIVITY CENTRE (YAC)

TENNYSON STREET

BENCHMARK
GALV IRON NAIL
RL 4.14

FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
00	IFC	27/09/24	NP	NP	CG	CG

SCALES:
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Full Size 1:200 ; Half Size 1:400
Scale (m)

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

PROJECT: TENNYSON STREET EXTENSION

DRAWING TITLE: BULK EARTHWORKS

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J5772	1200	00

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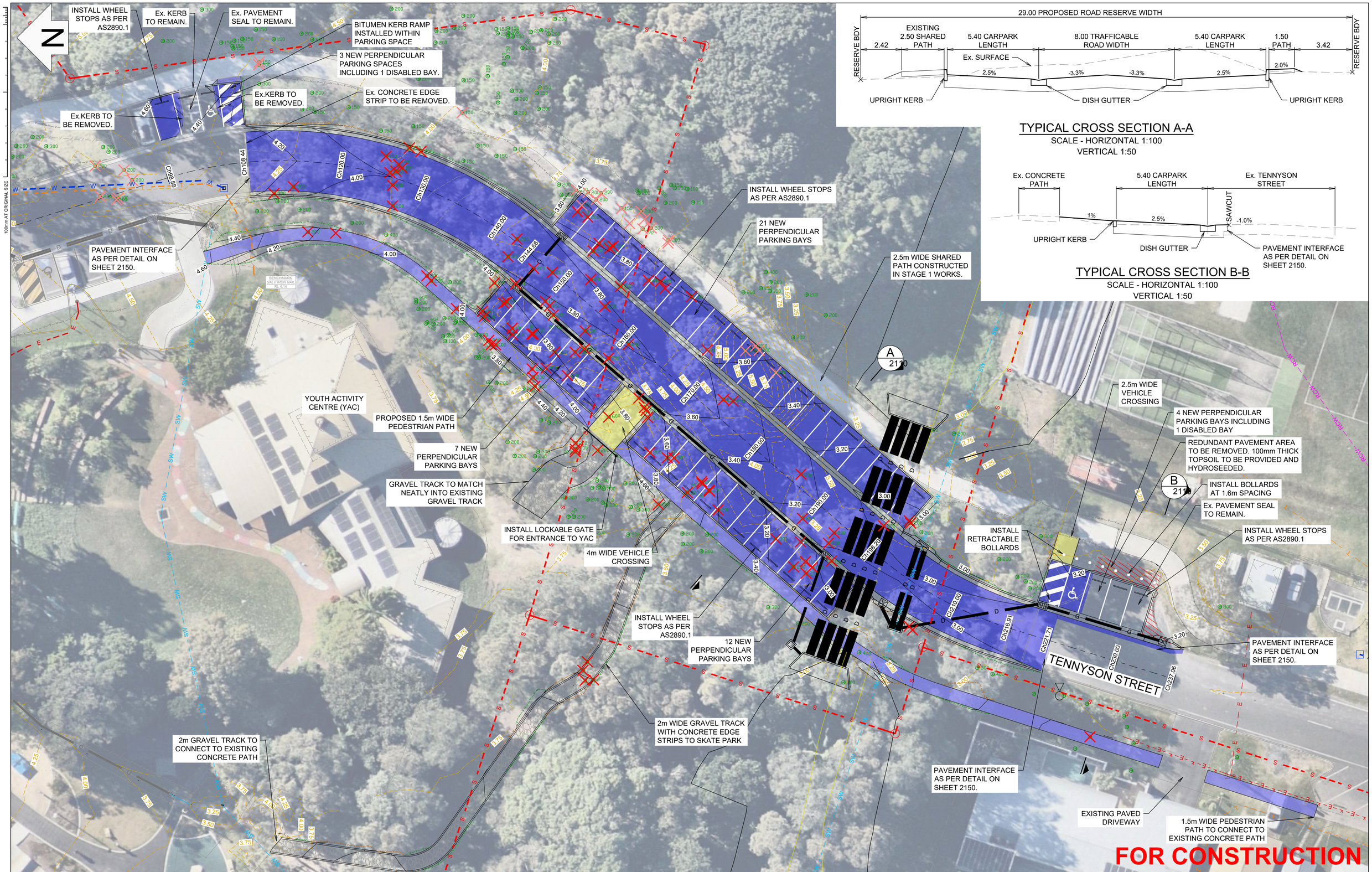

TYPICAL CROSS SECTION A-A

SCALE - HORIZONTAL 1:100
VERTICAL 1:50

TYPICAL CROSS SECTION B-B

SCALE - HORIZONTAL 1:100
VERTICAL 1:50

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
00	IFC	27/09/24	NP	NP	CG	CG

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Full Size 1:200 ; Half Size 1:400
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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: TENNYSON STREET EXTENSION

DRAWING TITLE: ROAD - LAYOUT PLAN

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J5772	1300	00

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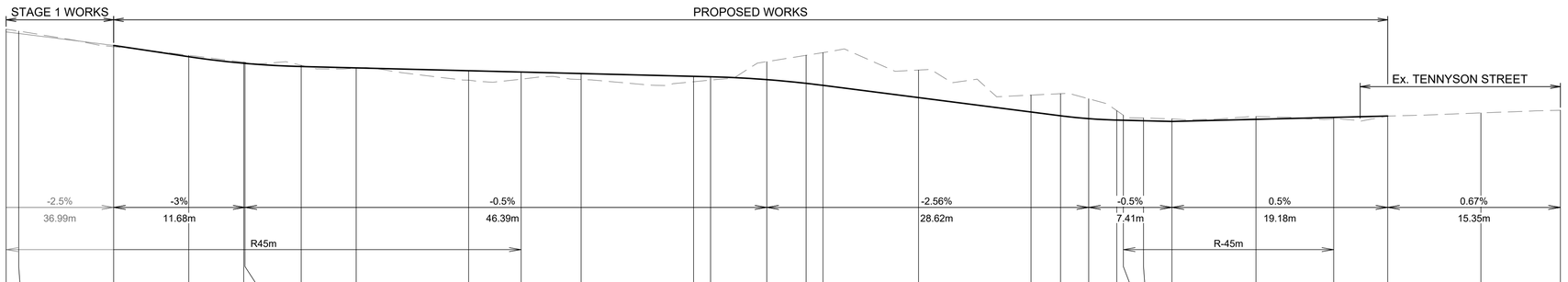
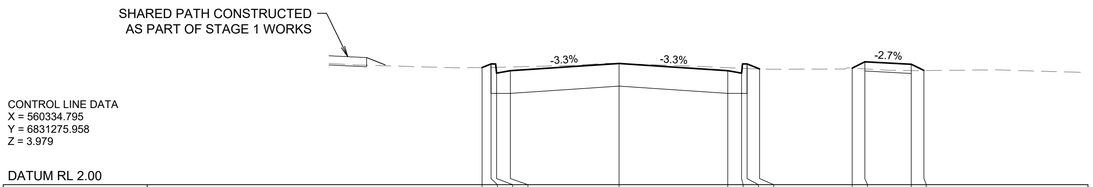

STAGE 1 WORKS
PROPOSED WORKS
Ex. TENNYSON STREET

| | | |

100mm AT ORIGINAL SIZE



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Z = 3.979

DATUM RL 2.00

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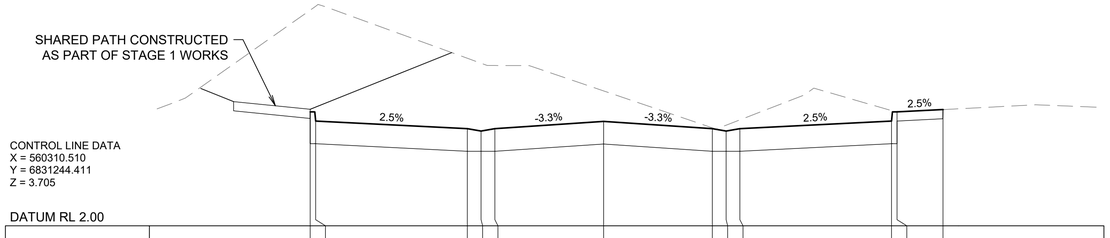

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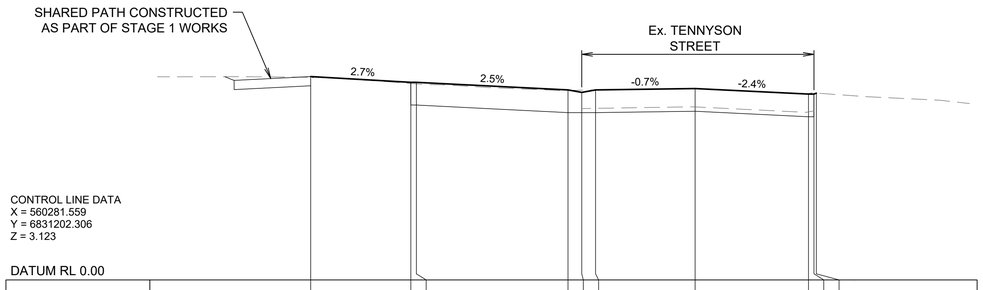

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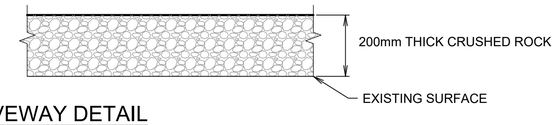
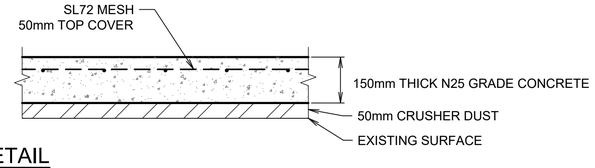
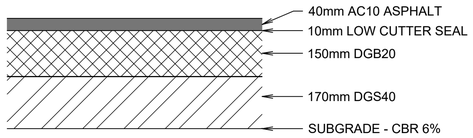


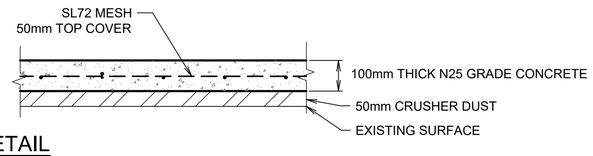
GRAVEL DRIVEWAY DETAIL
SCALE 1:10



DRIVEWAY DETAIL
SCALE 1:10



FULL DEPTH PAVEMENT DETAIL
SCALE 1:10



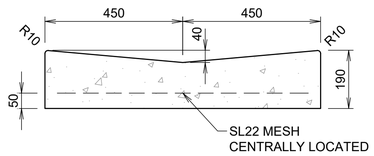
FOOTPATH DETAIL
SCALE 1:10

NOTE

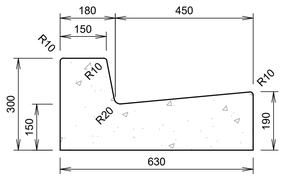
AC & SEAL TO CONFORM TO TfNSW R116 SPECIFICATION FOR HEAVY DUTY DENSE GRADES ASPHALT AND R106 FOR SPRAYED BITUMINOUS SURFACING.

NOTE

PAVEMENT DESIGNED BY CIVIL CONSULT. REFER PAVEMENT INVESTIGATION AND DESIGN REPORT 21071-00-REP-0001 DATED 18/08/2021 FOR MORE DETAILS.

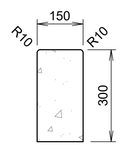


DISH GUTTER DETAIL
NOT TO SCALE

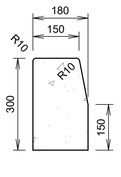


UPRIGHT KERB (B1) DETAIL
NOT TO SCALE

NOTE:
REFER NRLG SD R-03
FOR FURTHER DETAILS.



EDGE RESTRAINT (ER2) DETAIL
NOT TO SCALE



UPRIGHT KERB (B2) DETAIL
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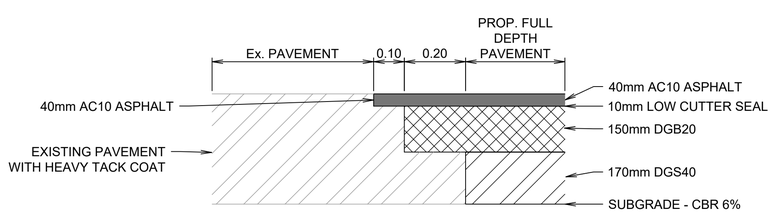

PAVEMENT INTERFACE DETAIL
SCALE 1:10

FOR CONSTRUCTION

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00	IFC	27/09/24	NP	NP	CG	CG

SCALES:
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Full Size 1:10 ; Half Size 1:20
Scale (m)

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CLIENT: BYRON SHIRE COUNCIL

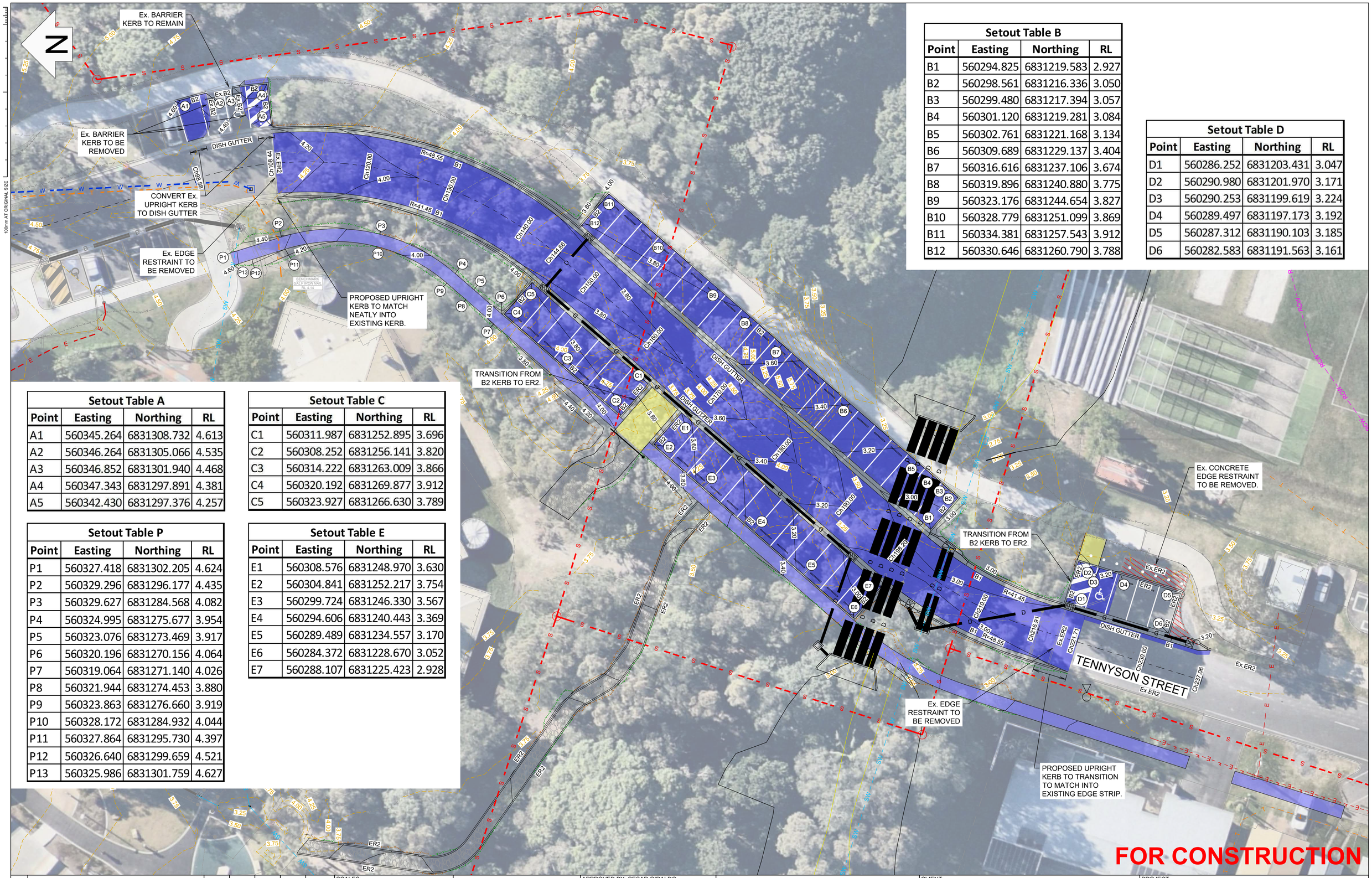
LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: TENNYSON STREET EXTENSION

DRAWING TITLE: CONSTRUCTION DETAILS

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J5772	1400	00

CAD FILE: C:\12DS\DATA\PLANITSYN\J7572 - SANDHILLS ESTATE_7867 - ENGINEERING\7.4 DRAFTING\J7572 - GILMORE CRESCENT - DETAIL PLAN STAGE 2.DWG PLOTTED BY: NICK.PLETTING PLOT DATE: 27/09/2024 1:16:23 PM



Setout Table A

Point	Easting	Northing	RL
A1	560345.264	6831308.732	4.613
A2	560346.264	6831305.066	4.535
A3	560346.852	6831301.940	4.468
A4	560347.343	6831297.891	4.381
A5	560342.430	6831297.376	4.257

Setout Table B

Point	Easting	Northing	RL
B1	560294.825	6831219.583	2.927
B2	560298.561	6831216.336	3.050
B3	560299.480	6831217.394	3.057
B4	560301.120	6831219.281	3.084
B5	560302.761	6831221.168	3.134
B6	560309.689	6831229.137	3.404
B7	560316.616	6831237.106	3.674
B8	560319.896	6831240.880	3.775
B9	560323.176	6831244.654	3.827
B10	560328.779	6831251.099	3.869
B11	560334.381	6831257.543	3.912
B12	560330.646	6831260.790	3.788

Setout Table C

Point	Easting	Northing	RL
C1	560311.987	6831252.895	3.696
C2	560308.252	6831256.141	3.820
C3	560314.222	6831263.009	3.866
C4	560320.192	6831269.877	3.912
C5	560323.927	6831266.630	3.789

Setout Table D

Point	Easting	Northing	RL
D1	560286.252	6831203.431	3.047
D2	560290.980	6831201.970	3.171
D3	560290.253	6831199.619	3.224
D4	560289.497	6831197.173	3.192
D5	560287.312	6831190.103	3.185
D6	560282.583	6831191.563	3.161

Setout Table E

Point	Easting	Northing	RL
E1	560308.576	6831248.970	3.630
E2	560304.841	6831252.217	3.754
E3	560299.724	6831246.330	3.567
E4	560294.606	6831240.443	3.369
E5	560289.489	6831234.557	3.170
E6	560284.372	6831228.670	3.052
E7	560288.107	6831225.423	2.928

Setout Table P

Point	Easting	Northing	RL
P1	560327.418	6831302.205	4.624
P2	560329.296	6831296.177	4.435
P3	560329.627	6831284.568	4.082
P4	560324.995	6831275.677	3.954
P5	560323.076	6831273.469	3.917
P6	560320.196	6831270.156	4.064
P7	560319.064	6831271.140	4.026
P8	560321.944	6831274.453	3.880
P9	560323.863	6831276.660	3.919
P10	560328.172	6831284.932	4.044
P11	560327.864	6831295.730	4.397
P12	560326.640	6831299.659	4.521
P13	560325.986	6831301.759	4.627

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: TENNYSON STREET EXTENSION

DRAWING TITLE: KERB SETOUT PLAN

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J5772	1500	00

CAD FILE: C:\12DS\DATA\PLANITSYNJ7572 - SANDHILLS ESTATE_7867 - ENGINEERING\7.4 DRAFTING\J7572 - GILMORE CRESCENT - DETAIL PLAN STAGE 2.DWG PLOTTED BY: NICK.PLETTING PLOT DATE: 27/09/2024 1:16:46 PM

100mm AT ORIGINAL SIZE

PROPOSED FOUR CELL 900Ø RCP HEADWALL (EAST) - IL1.30. AS PER TFNSW DRAINAGE SERIES R0210-10. BLOCK HEADWALLS UNTIL PERMANENT CHANNEL IS BUILT.

EXISTING STORMWATER PIT

PROPOSED 4 900Ø RCP AT IL1.30

DRAINAGE PIT TO BE CONNECTED TO EXISTING Ø750 RCP.

REPLACE EXISTING Ø750 RCP FOR TWO Ø600 STORMPRO

300Ø STORMPRO OUTLET IN WING OF HEADWALL (WEST) - IL1.30

PROPOSED FOUR CELL 900Ø RCP HEADWALL (WEST) - IL1.30. AS PER TFNSW DRAINAGE SERIES R0210-10. BLOCK HEADWALLS UNTIL PERMANENT CHANNEL IS BUILT.

DRAINAGE PIT TO BE CONNECTED TO EXISTING Ø750 RCP

Ø375 STORMPRO
DS IL = 1.73
US IL = 1.67

TENNYSON STREET

FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
00	IFC	27/09/24	NP	NP	CG	CG

SCALES:
0 2.5 5 10 15
Full Size 1:250 ; Half Size 1:500
Scale (m)

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APPROVED BY: CESAR GIRALDO

DATE: 27/09/24

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CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: TENNYSON STREET EXTENSION

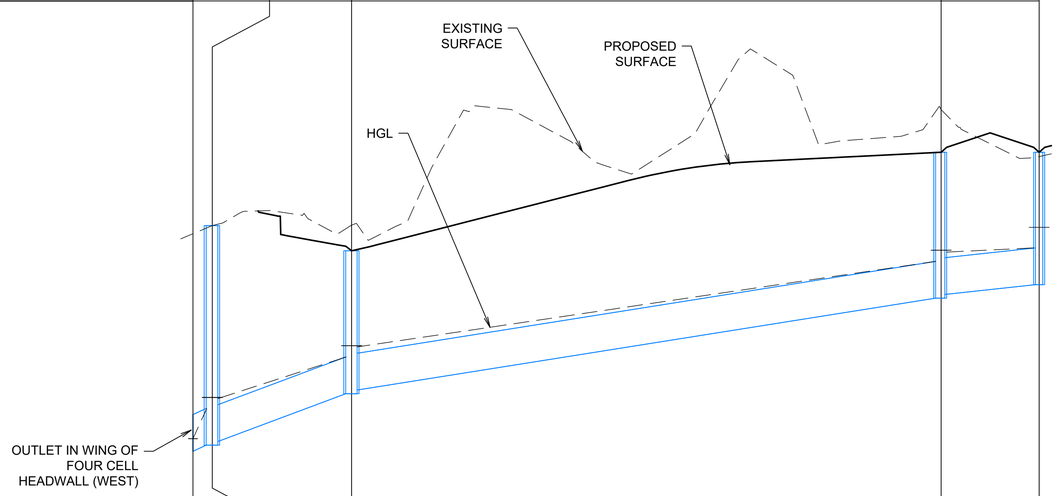
DRAWING TITLE: DRAINAGE - LAYOUT PLAN

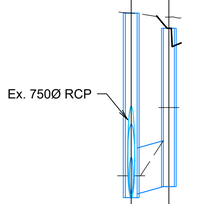
ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J5772	1600	00

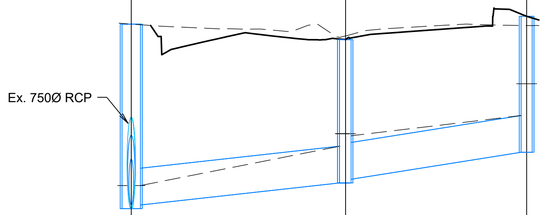
CAD FILE: C:\12DS\DATA\PLANITSYNJ7572 - SANDHILLS ESTATE_7867 - ENGINEERING\7.4 DRAFTING\J7572 - GILMORE CRESCENT - DETAIL PLAN STAGE 2.DWG PLOTTED BY: NICK.PLETTING PLOT DATE: 27/09/2024 1:16:34 PM

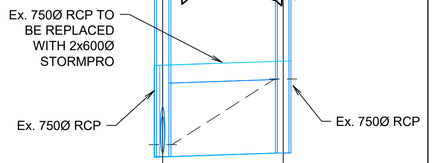
100mm AT ORIGINAL SIZE

STRUCTURE NAME	1/1	2/1	3/1	4/1	5/1	2/2	1/2	2/2	3/2	4/2	2/2	1/3
STRUCTURE DESCRIPTION	300Ø OUTLET IN WING OF 4X900Ø RCP HEADWALL (WEST)	900 x 900 JP AS PER NRLG STD DWG SW-02	TYPE 'B' COVER	LINTEL PIT AS PER NRLG STD DWG SW-01	TYPE 'D' COVER	600 x 900 DISH DRAIN INLET PIT WITH GRATING AND FRAME AS PER TfNSW STD DWG R0220-51	TYPE 'D' COVER	600 x 900 DISH DRAIN INLET PIT WITH GRATING AND FRAME AS PER TfNSW STD DWG R0220-51	TYPE 'D' COVER	900 x 1200 JP AS PER NRLG STD DWG SW-02 TO BE CONSTRUCTED OVER Ex. 750Ø RCP	TYPE 'B' COVER	900 x 1200 JP AS PER NRLG STD DWG SW-02 TO BE CONSTRUCTED OVER Ex. 750Ø RCP	TYPE 'B' COVER	900 x 1200 JP AS PER NRLG STD DWG SW-02 TO BE CONSTRUCTED OVER Ex. 750Ø RCP
												LINTEL PIT AS PER NRLG STD DWG SW-01 TO BE CONSTRUCTED OVER Ex. 750Ø RCP	TYPE 'D' COVER	LINTEL PIT AS PER NRLG STD DWG SW-01 TO BE CONSTRUCTED OVER Ex. 750Ø RCP	TYPE 'D' COVER	TYPE 'D' COVER





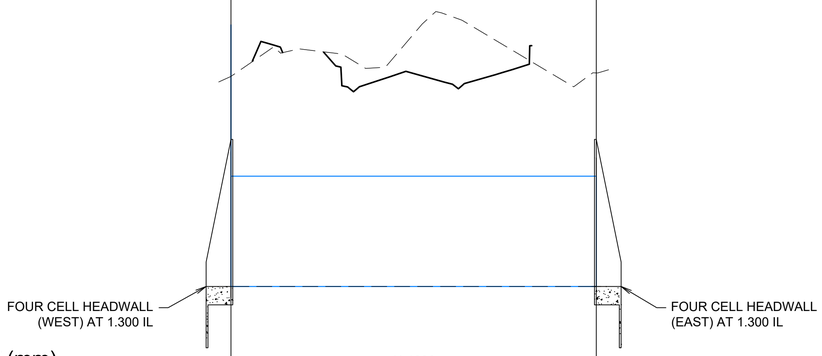




| | | | | | | | | | | | |

100mm AT ORIGINAL SIZE

STRUCTURE NAME	1/4	2/4
STRUCTURE DESCRIPTION	FOUR CELL 900Ø RCP HEADWALL (WEST) AS PER TFNSW DRAINAGE SERIES R0210-10	FOUR CELL 900Ø RCP HEADWALL (EAST) AS PER TFNSW DRAINAGE SERIES R0210-10



PIPE SIZE (mm)		(4x)900 RCP	
PIPE CLASS			
PIPE GRADE (%)		0.00%	
PIPE SLOPE (1 in X)			
FULL PIPE VELOCITY (m/s)		0.00	
PART FULL VELOCITY (m/s)		0.00	
DATUM RL	-1.0		
PIPE FLOW - 10% AEP (Cumecs)		0.000	
PIPE CAPACITY AT GRADE	1.300	0.000	1.300
HYDRAULIC GRADE LEVEL	1.300	1.300	1.300
DEPTH TO INVERT	2.136	2.136	1.099
INVERT LEVEL OF DRAIN	1.300	1.300	1.300
DESIGN SURFACE LEVEL	3.436		2.399
SETOUT COORDINATES	E560279.277 N6831228.772		E560307.323 N6831218.648
CHAINAGE	0.000	29.817	29.817

FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
00	IFC	27/09/24	NP	NP	CG	CG

SCALES:
0 2.5 5 10 15
Full Size 1:250 ; Half Size 1:500
Scale (m)

0 0.25 0.5 1.0 1.5
Full Size 1:25 ; Half Size 1:50
Scale (m)

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: TENNYSON STREET EXTENSION

DRAWING TITLE: DRAINAGE - LONGITUDINAL SECTIONS 2 OF 2

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J5772	1612	00

CAD FILE: C:\12DS\DATA\PLANITSYN\J7572 - SANDHILLS ESTATE_786\7 - ENGINEERING\7.4 DRAFTING\J7572 - GILMORE CRESCENT - DETAIL PLAN STAGE 2.DWG PLOTTED BY: NICK.PLETTING PLOT DATE: 27/09/2024 1:16:53 PM

100mm AT ORIGINAL SIZE

N

DISABLED LINEMARKING AS PER AS1742.2

LINEMARKING AS PER AS1742.2

5.40 2.60 2.40

Ch98.88 Ch108.44 Ch120.00 Ch130.00 Ch140.00 Ch144.66 Ch150.00 Ch160.00 Ch170.00 Ch180.00 Ch190.00 Ch198.20 Ch210.00 Ch216.91 Ch221.71 Ch230.00 Ch237.06

BENCHMARK
GALV IRON NAIL
RL 6.14

YOUTH ACTIVITY CENTRE (YAC)

LINEMARKING AS PER AS1742.2

LINEMARKING AS PER AS1742.2

LINEMARKING AS PER AS1742.2

EXISTING SIGN REMOVED BY OTHERS AS PART OF SHARED PATH WORKS

DISABLED LINEMARKING AS PER AS1742.2

LINEMARKING AS PER AS1742.2

EXISTING PARKING SIGN TO BE UPDATED

TENNYSON STREET

Ex. SIGNAGE TO BE RELOCATED OR REMOVED

EXISTING PARKING METER TO BE RELOCATED CLEAR OF PROPOSED PATH

FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
00	IFC	27/09/24	NP	NP	CG	CG

SCALES:
0 2 4 8 12
Full Size 1:200 ; Half Size 1:400
Scale (m)

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CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: TENNYSON STREET EXTENSION

DRAWING TITLE: SIGNAGE & LINEMARKING PLAN

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J5772	1700	00

CAD FILE: C:\12DS\DATA\PLANITSYNJ7572 - SANDHILLS ESTATE_78\7 - ENGINEERING\7.4 DRAFTING\J7572 - GILMORE CRESCENT - DETAIL PLAN STAGE 2.DWG PLOTTED BY: NICK.PLETTING PLOT DATE: 27/09/2024 1:16:37 PM

N

TENNYSON STREET

REMAINDER OF LOT NOT SURVEYED

REMAINDER OF LOT NOT SURVEYED

REMAINDER OF LOT NOT SURVEYED

CONCRETE

PATH

EXISTING CONCRETE PATH

SITE BOUNDARY

RX1 RX1

O P EE E D C CC B BB A

L7 L8 L9

15

L15 is on top of enew 375 SW pipe, move north by minimum 500mm

L7 location will need minor veg trimming, However trench would like need to shift 800mm close to path. Trench to follow as tight as possible to path, i.e 700mm offset from back of path

Standard alignment deviation due to SW headwall

457
DP 1087879

Reduced Trench Profile

L8 looks like the same location from before revision. Needs around 300mm movement to the south to miss both the 4x900 pipes and existing 750mm pipe

update L9 location as per rev D

444
SEC 28
DP 758207

REV	AMENDMENT DETAILS	BY	DATE
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
A	ORIGINAL ISSUE	P.R	XX.XX.XX

1 THE INTENDED PURPOSE OF THIS PLAN IS THAT OF A CONSTRUCTION DRAWING DEPICTING ELECTRICAL RETICULATION REQUIREMENTS. THIS PLAN IS NOT TO BE USED BY ANY OTHER PERSON OR CORPORATION. ECL POWER SERVICES ACCEPTS NO RESPONSIBILITY FOR ANY LOSS/DAMAGE SUFFERED HOWSOEVER ARISING TO ANY PERSON OR CORPORATION WHO MAY USE OR RELY ON THIS PLAN IN CONTRAVENTION OF THIS CLAUSE OR CLAUSES 2, AND 3, HEREOF.

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CERTIFIED BY

ECL POWER SERVICES PTY LTD
PO BOX 976
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NSW
EMAIL: EMAIL@ECLPOWERSERVICES.COM.AU
CONTACT NUMBER: 0497 414 478

UG LIGHTING INSTALL, BYRON SHIRE COUNCIL, GILMORE CRESCENT, BYRON BAY, NSW

ECN CASE No	XXX
SCALE	NTS
DRAWN BY	xxxx
DATE	xxxxxxx
CHECKED BY	xxxxxxx
FEEDER No	xxxxxxx
SCHEM REF	xxxxxxx
SURVEYED BY	xxxxxxx

POWER SERVICES

DRAWING NAME/No.	REVISION
XXXXXX	A

SHEET SIZE	SHEET No.	No. OF SHEETS
A3	1	8

N

Q

L14

F

F

RX1

RX1

457
DP 108787

TENNYSON ST

O

P

L15

REMAINDER OF LOT NOT SURVEYED

CONCRETE

PATH

L7

EE

E

2.2M HIGH SOLID SECURITY FENCE ALONG BOUNDARY

D

REMAINDER OF LOT NOT

CC

C

457
DP 1087879

–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
A	ORIGINAL ISSUE	P.R	XX.XX.XX
REV	AMENDMENT DETAILS	BY	DATE

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CONTACT NUMBER: 0497 414 478

UG LIGHTING INSTALL, BYRON SHIRE COUNCIL, GILMORE CRESCENT, BYRON BAY, NSW

ECN CASE No	XXX
SCALE	NTS
DRAWN BY	xxxx
DATE	xxxxxxx
CHECKED BY	xxxxxxx
FEEDER No	xxxxxxx
SCHEM REF	xxxxxxx
SURVEYED BY	xxxxxxx

POWER SERVICES

DRAWING NAME/No.	REVISION
XXXXXX	A

SHEET SIZE	SHEET No.	No. OF SHEETS
A3	2	8

457
DP 1087879

REMAINDER OF LOT NOT SURVEYED

EXISTING FOOTPATH

CONCRETE

PATH

BOUNDARY

SIGNAGE & FLAG POLES

OPT. 3 SERVICES LOCATION

TENNYSON ST

REMAINDER OF LOT NOT SURVEYED

ELECTRONIC ACCESS

SECURITY GATE

OPT. 1 SERVICES LOCATION

VISITOR 1

VISITOR 2

SECURE NSW POLICE PARKING

2.2M HIGH SOLID SECURITY FENCE ALONG BOUNDARY

1M FALL

L6 location fine, trench required to shift 500mm toward path to miss vegetation

REV	AMENDMENT DETAILS	BY	DATE
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
A	ORIGINAL ISSUE	P.R	XX.XX.XX

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CONTACT NUMBER: 0497 414 478

UG LIGHTING INSTALL, BYRON SHIRE COUNCIL, GILMORE CRESCENT, BYRON BAY, NSW

ECN CASE No	XXX
SCALE	NTS
DRAWN BY	xxxx
DATE	xxxxxxx
CHECKED BY	xxxxxxx
FEEDER No	xxxxxxx
SCHEM REF	xxxxxxx
SURVEYED BY	xxxxxxx

POWER SERVICES

DRAWING NAME/No.	REVISION
XXXXXX	B

SHEET SIZE	SHEET No.	No. OF SHEETS
A3	3	8

slight tree trimming

L11 fine, Tree requires trimming for install

requires tree trimming

CRESCENT

GILMORE

REMAINDER OF LOT NOT SURVEYED

457
DP 1087879

–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
A	ORIGINAL ISSUE	P.R	XX.XX.XX
REV	AMENDMENT DETAILS	BY	DATE

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CONTACT NUMBER: 0497 414 478

UG LIGHTING INSTALL, BYRON SHIRE COUNCIL, GILMORE CRESCENT, BYRON BAY, NSW

ECN CASE No	XXX
SCALE	NTS
DRAWN BY	xxxx
DATE	xxxxxxx
CHECKED BY	xxxxxxx
FEEDER No	xxxxxxx
SCHEM REF	xxxxxxx
SURVEYED BY	xxxxxxx

POWER SERVICES

DRAWING NAME/No.	REVISION
XXXXXX	A

SHEET SIZE	SHEET No.	No. OF SHEETS
A3	4	8

2
SEC 68
DP 758207

GILMORE CRESCENT

SITE BOUNDARY

457
DP 1087879

REMAINDER OF LOT NOT SURVEYED

Been place adjace to fire hydrant and with park access. Needs moving 500mm south and possible 100mm east.

this trench run requires vegeation clearing, otherwise we adopt 1400mm off edge of path here to avoid bollards and trees

GRATED PIT
ID: 7/1
PIT SIZE: 900x600
SL: 5.99
IL: 4.48
DEPTH: 1.51

STW PIPE
SIZE: 375mmØ STORMPRO
USIL: 4.47
DSIL: 4.32
LENGTH: 35.29
GRADE: 0.4%

GRATED K.I. PIT
ID: 6/1
PIT SIZE: 900x600
SL: 6.18
IL: 4.29
DEPTH: 1.89

STW PIPE
SIZE: 375mmØ STORMPRO
USIL: 4.30
DSIL: 4.18
LENGTH: 19.49
GRADE: 0.6%

GRATED PIT
ID: 5/1
PIT SIZE: 900x600
SL: 5.50
IL: 4.15
DEPTH: 1.35

STW PIPE
SIZE: 375mmØ STORMPRO
USIL: 4.15
DSIL: 3.91
LENGTH: 19.22
GRADE: 1.2%

REV	AMENDMENT DETAILS	BY	DATE
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
A	ORIGINAL ISSUE	P.R	XX.XX.XX

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EMAIL: EMAIL@ECLPOWERSERVICES.COM.AU
CONTACT NUMBER: 0497 414 478

UG LIGHTING INSTALL, BYRON SHIRE COUNCIL, GILMORE CRESCENT, BYRON BAY, NSW

ECN CASE No	XXX
SCALE	NTS
DRAWN BY	xxxx
DATE	xxxxxxx
CHECKED BY	xxxxxxx
FEEDER No	xxxxxxx
SCHEM REF	xxxxxxx
SURVEYED BY	xxxxxxx

POWER SERVICES

DRAWING NAME/No.	REVISION
XXXXX	A

SHEET SIZE	SHEET No.	No. OF SHEETS
A3	5	8

still in concrete path, needs shifting 0.7m north

still in concrete path, needs to move 1m west

GILMORE CRESCENT

REMAINDER OF LOT NOT SURVEYED

REMAINDER OF LOT NOT SURVEYED

REMAINDER OF LOT NOT SURVEYED

457
DP 1087879

457
DP 1087879

REV	AMENDMENT DETAILS	BY	DATE
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
A	ORIGINAL ISSUE	P.R	XX.XX.XX

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UG LIGHTING INSTALL, BYRON SHIRE COUNCIL, GILMORE CRESCENT, BYRON BAY, NSW

ECN CASE No	XXX
SCALE	NTS
DRAWN BY	xxxx
DATE	xxxxxxx
CHECKED BY	xxxxxxx
FEEDER No	xxxxxxx
SCHEM REF	xxxxxxx
SURVEYED BY	xxxxxxx

POWER SERVICES

DRAWING NAME/No.	REVISION
XXXXXX	A

SHEET SIZE	SHEET No.	No. OF SHEETS
A3	6	8

BENCHMARK
PM 30202
RL 6.075m (AHD)

1
SEC 68
DP 758207

SP 30458

GILMORE

CRESCENT

GRATED K.I. PIT
ID: 9/1
PIT SIZE: 900SQ
LINTEL: 2.4
SL: 5.70
IL: 4.74
DEPTH: 0.96

GRATED PIT
ID: 8/1
PIT SIZE: 900x600
SL: 5.83
IL: 4.62
DEPTH: 1.21

STW PIPE
SIZE: 375mmØ STORMPRO
USIL: 4.75
DSIL: 4.65
LENGTH: 19.79
GRADE: 0.5%

STW PIPE
SIZE: 375mmØ STORMPRO
USIL: 4.62
DSIL: 4.50
LENGTH: 13.54
GRADE: 0.9%

STW PIPE
SIZE: 375mmØ STORMPRO
USIL: 4.47
DSIL: 4.32
LENGTH: 35.29
GRADE: 0.4%

SITE BOUNDARY

REMAINDER OF LOT NOT SURVEYED

L1 In heavy vegetation, likely requires veg clearing and moving NW by 500mm. I know this may cause further issues with 24 lawson st due to non disturbance requirements

this directly goes under vegetation seen in L1 photos

REV	AMENDMENT DETAILS	BY	DATE
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A	ORIGINAL ISSUE	P.R	XX.XX.XX

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DATE CERTIFIED
CERTIFIED BY

ECL POWER SERVICES PTY LTD
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EMAIL: EMAIL@ECLPOWERSERVICES.COM.AU
CONTACT NUMBER: 0497 414 478

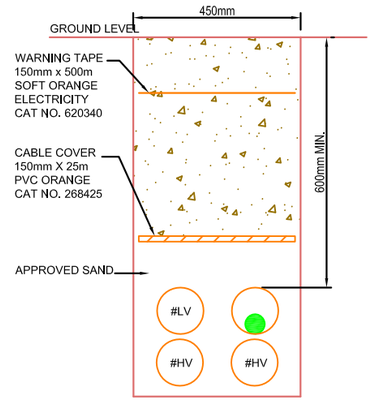
UG LIGHTING INSTALL, BYRON SHIRE COUNCIL, GILMORE CRESCENT, BYRON BAY, NSW

ECN CASE No	XXX
SCALE	NTS
DRAWN BY	xxxx
DATE	xxxxxxx
CHECKED BY	xxxxxxx
FEEDER No	xxxxxxx
SCHEM REF	xxxxxxx
SURVEYED BY	xxxxxxx

POWER SERVICES

DRAWING NAME/No.	REVISION
XXXXXX	A

SHEET SIZE	SHEET No.	No. OF SHEETS
A3	7	8



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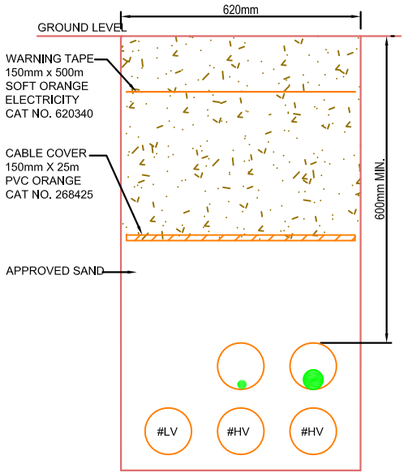

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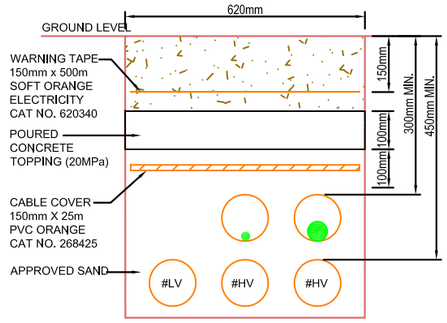

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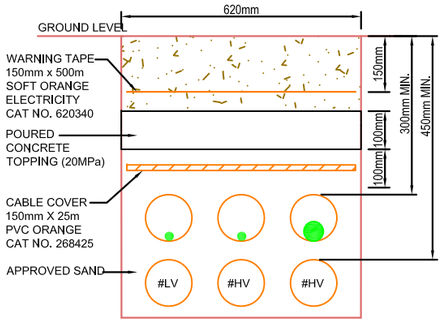

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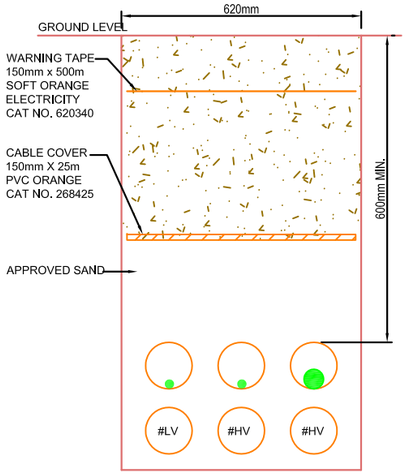

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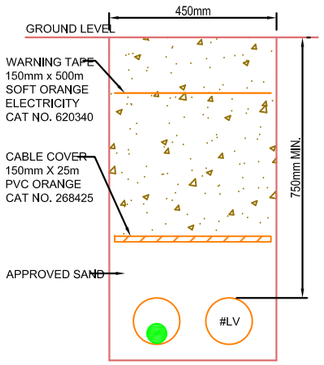

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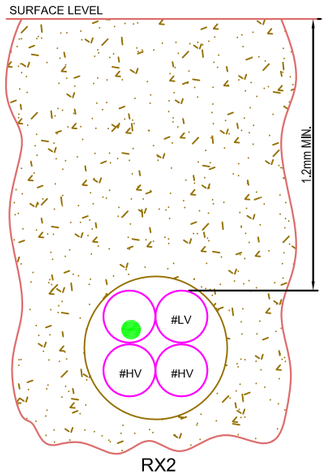

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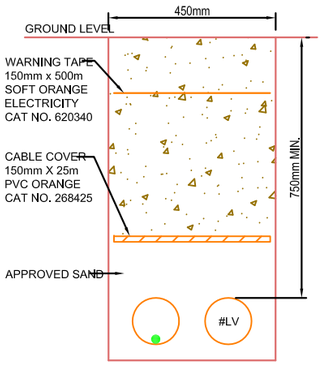

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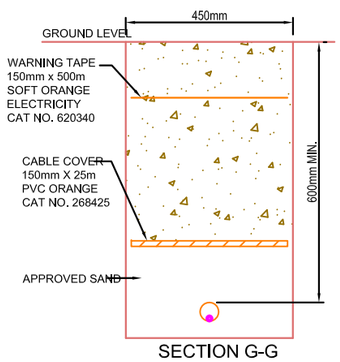

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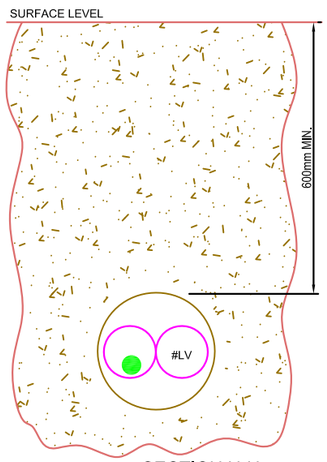

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SURVEYED BY	xxxxxxx

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A3	8	8

Appendix B – Biodiversity Assessment Report

RECONECO

Ecological Survey and Assessment Conservation Detection Dogs Feral Animal Management GIS

ABN: 27 161 007 183 M: 0437 233 336 E: craig@ReconEco.com.au A: PO Box 5313 East Lismore NSW, 2480 ReconEco Pty Ltd

Biodiversity Assessment

Gilmore Crescent – Stage 2

Prepared for: Planit Consulting
Date: January 2024

RECONECO

This report has been prepared for the use of the stated client and for the specific purpose described in the introduction and is not to be used for any other purpose or by any other person or business entity. ReconEco accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this report in contravention of the terms of this disclaimer.

Due consideration has been given to site conditions and to appropriate legislation and documentation available at the time of preparation of the report. As these elements are liable to change over time, the report is to be considered current at the time of preparation only.

The report relies on information supplied by the client and on findings obtained using accepted survey and assessment methodologies. The specific survey methodology utilised is described in the relevant section of the report.

While due care was taken during field survey and subsequent report preparation, ReconEco accepts no responsibility for any omissions that may have occurred due to the nature of the survey methodology.

Ian Colvin

Biodiversity Assessment Method (BAM) accredited assessor (BAAS18055)

Date	Document Version	Author	Client
10/01/2024	V1 (draft)	I. Colvin	Sean Cochran (Planit Consulting)
11/01/2024	V2 (final)	I. Colvin	Sean Cochran (Planit Consulting)

Executive Summary

ReconEco Pty Ltd has been engaged by Planit Consulting to complete a biodiversity assessment to assess the proposed road construction between Gilmore Crescent and Tennyson Street, Byron Bay. Stage 2 of the Gilmore Crescent extension forms part of the associated with Byron Shire Council's Sandhills Estate Activation project and involves the full extension of Gilmore Crescent through to Tennyson Street including provision of additional parking, shared pathway and roadside infrastructure adjoining the road. The project is the final stage of works at the site following on from various works to Gilmore Street and construction of a pedestrian footpath as part of Stage 1.

This assessment supports a Review of Environmental Factors (REF) prepared in accordance with requirements of part 5 of the *Environmental Planning and Assessment Act 1979*.

A summary of biodiversity matters is as follows:

- The site comprises highly disturbed Swamp Oak forest (PCT 4034).
- PCT 4034 is characteristic of the threatened ecological community (TEC) 'Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions' as listed in the BC Act.
- Two threatened flora species were recorded (Stinking Laurel *Cryptocarya foetida*, Fine-leaved Tuckeroo *Lepiderema pulchella*). A small local population of Stinking Laurel (27 trees/saplings) occurs within 250m of the study area. Some of these trees will require removal for the project.
- One threatened fauna species was recorded (a camp of Grey-headed Flying-foxes occurs nearby); the site provides potential opportunistic foraging habitat for several threatened fauna species.
- The proposed works may require the removal of native vegetation/habitat as follows:
  - 12 native trees >3 m in height for the proposed pathway. These trees occur scattered within a highly disturbed existing informal walking corridor
  - Approximately 2300 m² of disturbed Swamp Oak forest (PCT 4034), a TEC
  - Loss of nine Stinking Laurel for the proposed roadworks.
- A range of mitigation measures to minimise biodiversity impacts have been prescribed.

The proposal was assessed under the following statutory/policy requirements:

- *Biodiversity Conservation Act 2016* (BC Act): a test of significance completed under s7.3 of the BC Act determined that the proposal would be unlikely to result in significant biodiversity impacts and a BDAR is not required on this basis.
- SEPP (Resilience & Hazards) 2021: the proposal is unlikely to result in deleterious impacts to nearby coastal wetlands.
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act): matters of national environmental significance (MNES) in the EPBC Act have been reviewed and assessed. The impacts of the proposal on MNES are not significant and referral of the project is not required.

As a result of this assessment, no further assessment or requirements apply.

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1 Introduction & Background

1.1 Introduction

ReconEco Pty Ltd has been engaged by Planit Consulting to complete a biodiversity assessment to assess the proposed road construction between Gilmore Crescent and Tennyson Street, Byron Bay. Stage 2 of the Gilmore Crescent extension forms part of the associated with Byron Shire Council's Sandhills Estate Activation project and involves the full extension of Gilmore Crescent through to Tennyson Street including provision of additional parking, shared pathway and roadside infrastructure adjoining the road. The project is the final stage of works at the site following on from various works to Gilmore Street and construction of a pedestrian footpath as part of Stage 1.

The aim of this assessment is to:

1. Identify the biodiversity values of the site, including:
   - vegetation communities and their condition
   - threatened flora species* and their habitats
   - threatened ecological communities (TECs)*
   - habitat for threatened fauna*
   - significant habitat features (eg. koala habitat trees, hollow bearing trees, microbat roosting habitat)
   - significant aquatic habitat.
2. Assess the proposal against relevant statutory requirements
3. Prescribe a range of mitigation measures to avoid or minimise biodiversity impacts.

**Biodiversity Conservation Act 2016* (BC Act), *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.2 Background

Stage 1 of the Gilmore Crescent extension is currently under construction and was approved by Byron Shire Council (BSC) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EPA Act) in February 2023. The scope of the road works included construction of a cul de sac, parking and new shared path through to Tennyson Street. An addendum to the REF was approved in April 2023 to account for impacts on two additional Stinking Laurel (*Cryptocarya foetida*) identified in the clearing footprint by the project's ecologist during the pre-clearing survey. The impacts on the Stinking Laurel will be offset under a vegetation management plan being implemented by BSC for the Sandhills Estate Activation project.

Stage 2 of the Gilmore Crescent extension is the subject of the REF which this biodiversity assessment supports and involves the full extension of Gilmore Crescent through to Tennyson Street including provision of additional parking, shared pathway, pathway linkage to the Byron Skate Park and roadside infrastructure.

Planit Consulting have been engaged with the project from an early stage and completed a biodiversity assessment to support Stage 1 of the project in December 2022. The Planit assessment recorded the threatened species the threatened species Stinking Laurel (*Cryptocarya foetida*) at several locations and worked with project engineers to revise the proposed pathway to the skatepark to avoid impacts to any trees of this species. The Planit assessment also completed a comprehensive overview of the biodiversity values of the greater 'Sandhill Estate' informed by targeted flora and fauna survey.

On this basis, this assessment can be considered an addendum to the Planit Stage 1 assessment and is focussed on potential vegetation and threatened flora impacts resulting from the revised design. Potential fauna habitat constraints and impacts of the project (as a whole) have been documented previously for Stage 1 and these are not reproduced or discussed further in detail.

1.3 The site

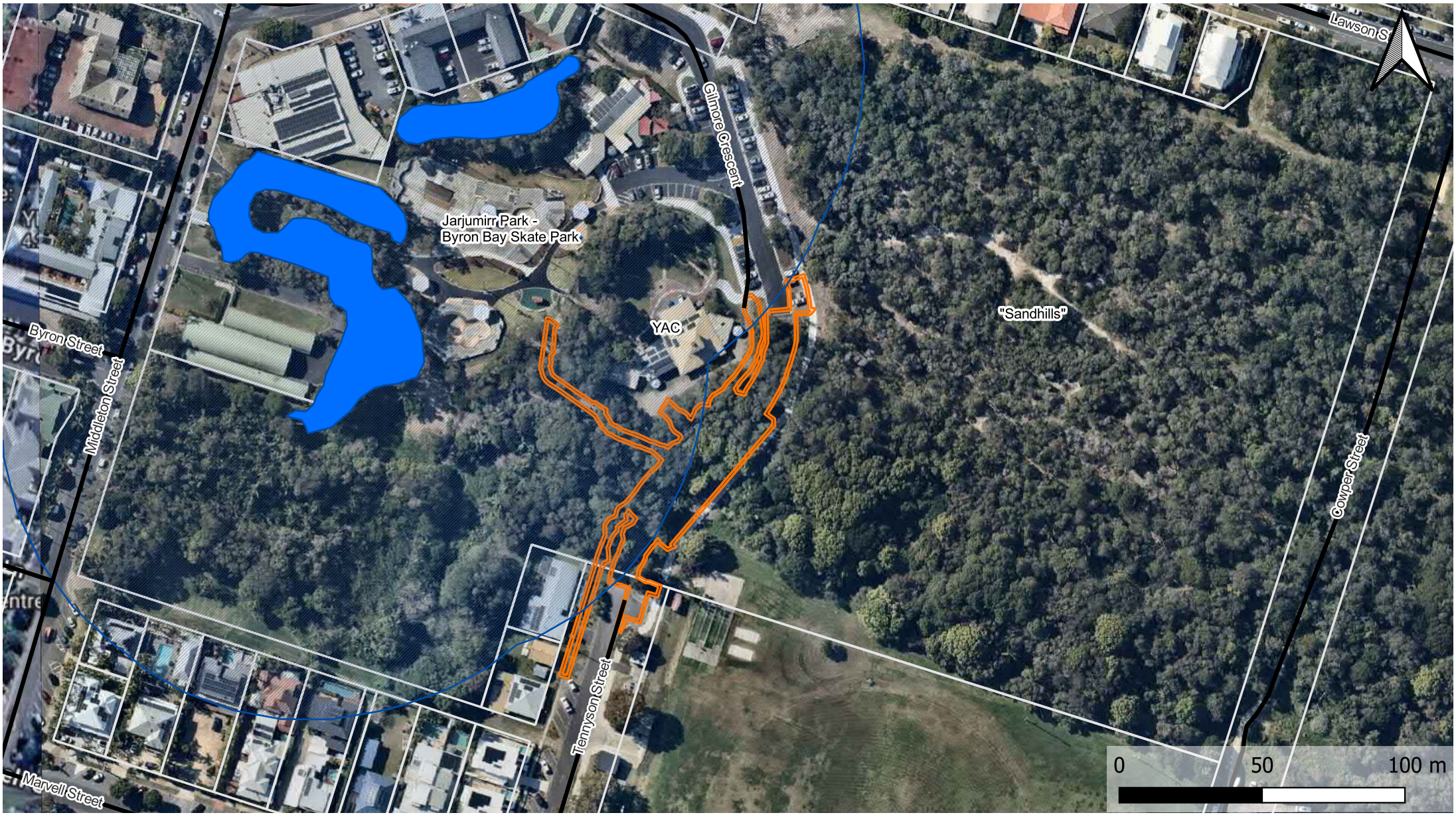
The site comprises Lot 457 DP1087879 Gilmore Crescent Byron Bay, known as 'Sandhills Estate' (refer **Figure 1**), which is Crown Land under the management of BSC. Coastal Wetlands mapped under SEPP (Resilience & Hazards) 2021 occur in the western portion of the site; the proposed road is within the 100m proximity to these wetlands (refer **Figure 1**).

For the purpose of this report, the focus is on the proposal footprint and adjacent land – this comprises the study area; no assessment has been completed for other parts of the site.

1.4 The proposal

The proposal ('the Activity') involves the full extension of Gilmore Crescent through to Tennyson Street including provision of additional parking, shared pathway, pathway linkage to the Byron Skate Park and roadside infrastructure (refer concept at **Appendix A**). The proposal requires vegetation clearing for the road extension, while the pathway linkage has been designed to avoid trees around an existing unformal/unformed pathway.

Once operational, the through road will have a posted speed limit of 50 km/hr.



RECONECO

Figure 1: Site plan

Scale:1:2000
Date: Jan 2024
Author: LD

EPSG: 28356
Datum: GDA94

Legend

- Limit of works
- Cadastral boundaries

Coastal Wetlands

- Coastal Wetlands
- Proximity Area for Coastal Wetlands

ReconEco makes every effort to ensure this map is free of errors but doesn't warrant the map or any data/features depicted are either spatially or temporally accurate or fit for a particular use. ReconEco provides this map without any warranty of any kind whatsoever, either express or implied.

2 Methodology

The methodology for this assessment has included both a desktop review and field survey.

2.1 Desktop Review

A range of online databases and information sources were searched to inform the assessment including:

- Atlas of NSW Wildlife (BioNet) database to identify confirmed records of threatened species within the locality (10km x 10km area centred on the site); refer **Appendix B**
- Protected Matters Search Tool (PMST) to determine any Matters of National Environmental Significance (MNES) within a 5km radius of the site; refer **Appendix B**
- Fisheries NSW Spatial Data Portal
- Council online mapping
- Previous biodiversity assessments (Planit etc).

2.2 Field Survey

Field assessment was completed by an experienced ecologist on the 8th December 2023, following surveyor peg out/marking of the walkway for easy identification. Field survey included:

- Targeted searches for threatened flora (namely Stinking Laurel *Cryptocarya foetida*) via parallel transects of 5m spacings through the project footprint
- Ground-truthing of vegetation communities (including threatened ecological communities)
- Identification of any key habitat features (eg. tree hollows, active nests, termitaria)
- Opportunistic fauna survey (visual/aural records).

Photographs from the field survey are provided at **Appendix C**.

Survey limitations

Field assessment did not include targeted fauna surveys due to previous comprehensive surveys by Planit Consulting (2022) and Dr Jonathon Parkyn (2022). Rather, a habitat assessment was undertaken to identify habitat features/values on the site and determine the suitability of the site for occupancy by any threatened species known or likely to occur on the site and in surrounding landscape.

A summary of previous survey effort by Planit for Stage 1 of the project is provided at **Table 2.1**.

Table 2.1 *Targeted fauna survey summary (Source: Planit 2022)*

Survey technique	Details
Diurnal Surveys	
Binocular search and identification of all fauna Bird identification surveys	5 x dawn/mid-morning (30 minutes) and 4 x dusk (4 x 45 minutes)
Ground track/trace survey	Opportunistically performed during other survey works
Diurnal frog-call recognition and identification	Opportunistically performed during other survey works
Ground strata searches and rock/timber/leaf litter rolls and examination for reptiles, frogs, Coastal petaltail and Mitchell's rainforest snail	5 x 30 minutes during the middle of the day or night (for Mitchell's Rainforest Snail), opportunistic during all other survey works
Spot Assessment Technique (SAT) for Koala faecal pellets per Phillips and Callaghan (2011)	3 x SAT sites surveyed
Opportunistic microbat roost searches	
Camera trap survey	14 motion triggered trail cameras (ScoutGuard) placed within the study area for 34 days
Nocturnal Surveys	
Audible survey for calls, scratching and landings	1-2 researchers over 4 nights for 120 minutes each night

Survey technique	Details
Spotlighting survey	
Naked eye observation utilising dawn/dusk/moon light for bats and fauna returning to potential nest/shelter areas	Four dusk/evenings
Passive acoustic survey	A songmeter SM4 was deployed between dusk and dawn for 34 nights at 4 different locations
Microbat (Anabat) survey	1-2 devices for 34 nights at five locations
Amphibian nocturnal searches adjacent to drainage lines and swamp forests	Four nights proximate to drainage lines and wetlands
Camera trap survey	14 motion triggered trail cameras (ScoutGuard) placed within the study area for 34 nights
Call playback survey	Various species; 5 dawn/early mornings and 4 dusks and nights

3 Desktop Review

Results of the desktop review are summarised in **Table 3.1**.

Table 3.1 *Desktop review assessment*

Resource	Results
BioNet database (*10km x 10km search centred on the site; refer* ***Appendix B***)	Confirmed records of 32 threatened flora and 67 threatened fauna. Potential habitat for several TECs.
Protected Matters Search Tool (PMST) (*search of 5km radius from the site; refer* ***Appendix B***)	Potential habitat for 104 threatened species, 7 TECs and 62 migratory species.
Biodiversity Values Map	The development footprint does not contain BV land, however connected vegetation within 100m to the west is mapped as BV land consistent with SEPP Coastal Wetlands mapping (refer **Figure 1**).
IBRA region and subregion	The site lies within the Burringbar-Conondale Ranges subregion of the South East Queensland IBRA region (Thackway & Cresswell, v7).
Mitchell landscape	The site lies within the Byron - Tweed Alluvial Plains of the SEQ Clarence Basin. Attributes include: *Channels, floodplain, terraces and estuary of the Tweed River and other coastal streams on Quaternary alluvium, general elevation 0 to 50m, local relief 15m. Uniform brown earths and structured brown clays on floodplains. Brown texture-contrast soil with high organic content on terrace remnants. Most of the valley is cleared but contained subtropical closed forest with; white booyong (Argyrodendron trifoliolatum), red cedar (Toona australis), and retains many rare species such as heart-leaved bosistoa (Bosistoa selwynii), velvet laurel (Endiandra hayesii), red-fruited ebony (Diospyros mabacea) and southern fontainea (Fontainea australis). Dry coastal hardwood forest on the terraces and slopes including; cabbage gum (Eucalyptus amplifolia), forest red gum (Eucalyptus tereticornis), broad-leaved apple (Angophora subvelutina), river oak (Casuarina cunninghamiana), silky oak (Grevillea robusta), rough-barked apple (Angophora floribunda), native teak (Flindersia australis), coastal grey box (Eucalyptus bosistoana), pink bloodwood (Corymbia intermedia), spotted gum (Corymbia maculata), grey ironbark (Eucalyptus paniculata), broad-leaved paperbark (Melaleuca quinquenervia), blackwood (Acacia melanoxylon) and black she-oak (Casuarina litoralis).*
Soils (eSPADE v2.2)	The site occurs on the Tyagarah soil landscape (eSPADE v2.2); attributes include: Landscape: sediment basins of mixed estuarine and aeolian origin forming level to gently undulating plains. Relief is <3 m, elevation <5 m and slopes <1%. Extensively cleared open- and closed-forest. Soils: deep (>150 cm), moderately well-drained minimal Prairie Soils near basaltic areas. Deep (>150 cm), well-drained Podzols and Acid Peats (O) near barrier systems. Deep (>200 cm), well-drained Podzols and Siliceous Sands in landscape variant tyb and deep (>200 cm), poorly drained Peaty Podzols near Tuckean soil landscape Limitations: very strongly acid, permeable, often waterlogged soils of low fertility and low waterholding capacity with localised salinity. Permanently high watertables and moderate wind erosion hazard.
Acid Sulfate Soils Risk (SEED)	The study area is mapped as L2 - Low probability of occurrence of acid sulfate soil 1-3m below ground surface.
Fisheries NSW Spatial Data Portal	No aquatic habitat is present within the study area.

Resource	Results
SEPP (Resilience & Hazards) 2021	The study site is within the proximity area of coastal wetlands (refer **Figure 1**).
Council mapping	Byron Council online mapping depicts vegetation at the site as being of high environmental value (HEV); refer **Plate 1**. Councils online mapping also depicts a flying fox camp to the east adjacent to Middleton Street (the 'Middleton Street camp'); refer **Plate 2**.
Byron Coast Comprehensive Koala Plan of Management	The site is not within a mapped Koala Management Precinct. None of the vegetation within the study area is mapped as potential Koala habitat.
NSW State Vegetation Type Map	Mapped Plant Community Types (PCT) at and adjacent to the study site include: • PCT3988 Far North Mesophyll Paperbark Swamp Forest • PCT3989 Far North Paperbark Fern Swamp Forest • PCT3553 Northern Sands Bloodwood-Swamp Turpentine Forest • PCT4004 Northern *Melaleuca quinquenervia* Swamp Forest.

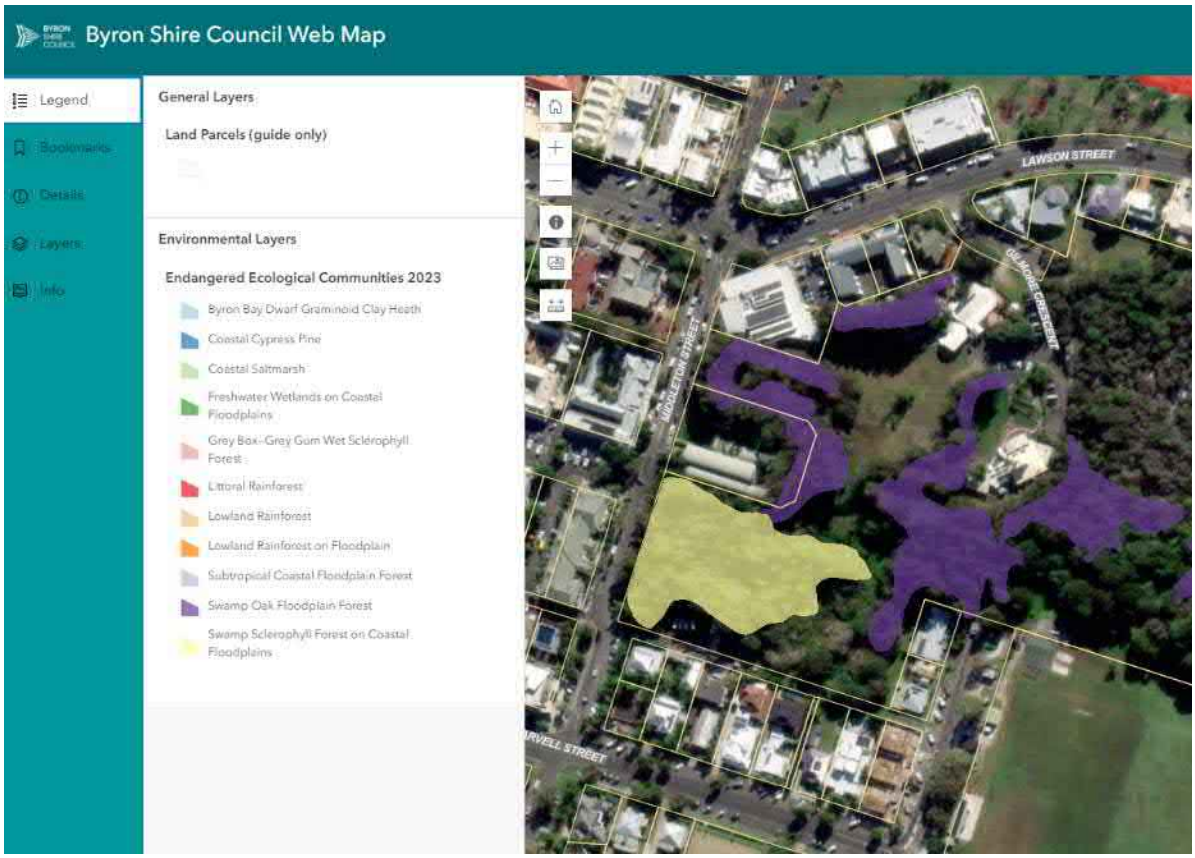


***Plate 1**. Screenshot from Byron Shire Council intramaps depicting threatened ecological community Swamp Oak Floodplain Forest (purple) and Swamp Sclerophyll Forest on Coastal Floodplain (yellow)*

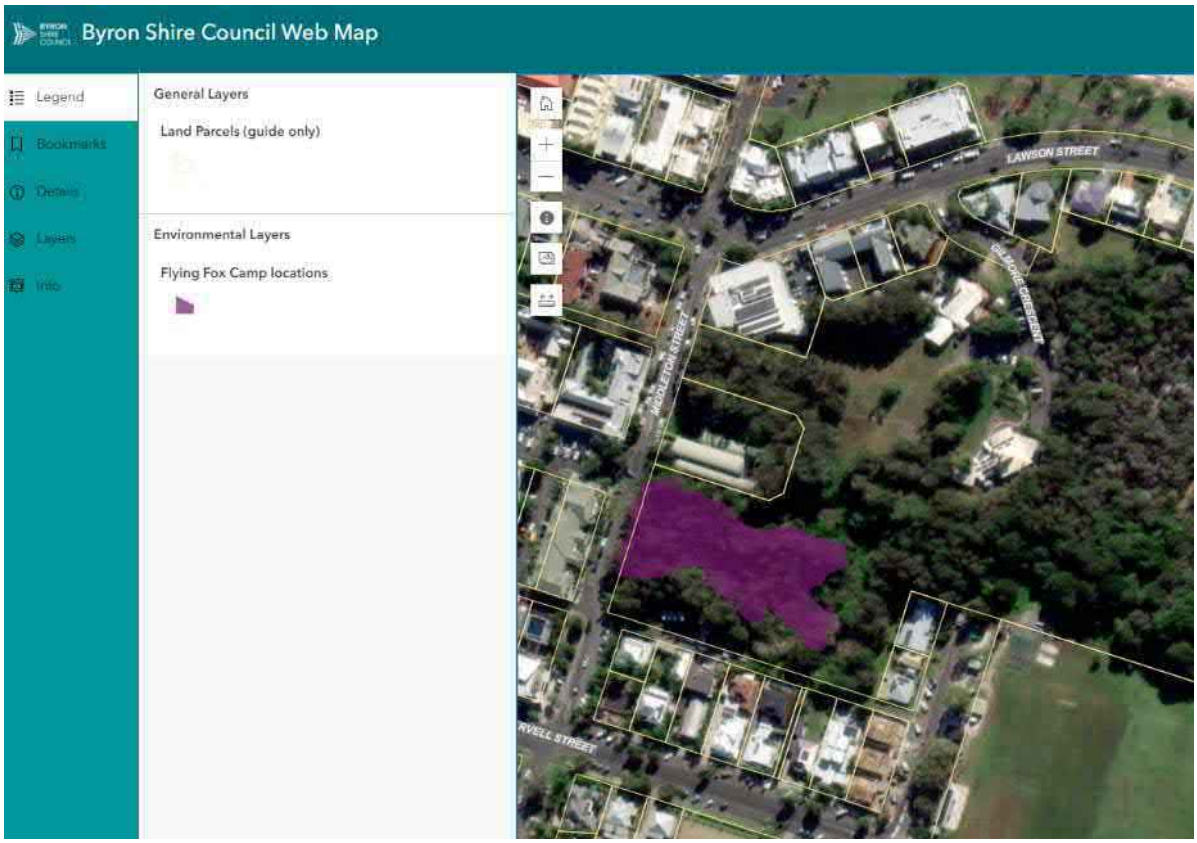


***Plate 2**. Screenshot from Byron Shire Council intramaps depicting Middleton Street flying-fox camp*

4 Vegetation Assessment

4.1 Vegetation

Vegetation at and adjacent to the site comprises degraded swamp forest dominated by Swamp Oak (*Casuarina glauca*). Due to informal pedestrian access, bush camping and thinning/trampling and rubbish dumping this community is highly disturbed and weed species are common. Vegetation communities and equivalent Plant Community Types (PCTs) at the site are described in **Table 4.1**. Previous vegetation mapping by Planit (2022) for the Stage 1 works is provided at **Plate 3**; note that PCTs have been revised since this time and PCT 1235 in the Planit mapping is equivalent to PCT 4034.

The Planit vegetation mapping showing subtle intergrades between PCT1235 and PCT1064 is considered overly refined; all this vegetation is reflective of Swamp Oak forest (PCT 1235/PCT 4034), generally consistent with Council TEC mapping (refer **Plate 1**). Revised vegetation mapping is provided at **Figure 2**.

Table 4.1 *Plant community types (PCTs)*

	Description	Equivalent PCT
1	Swamp sclerophyll forest dominated by Swamp Oak (*Casuarina glauca*) with infrequent Tuckeroo (*Cupaniopsis anacardioides*) and other common rainforest species	PCT 4034 Far North Swamp Oak-Tuckeroo Swamp Fringe Forest
2	Grassland/disturbed: disturbed areas dominated by exotic grasses and/or Singapore Daisy*.	n/a

*introduced species

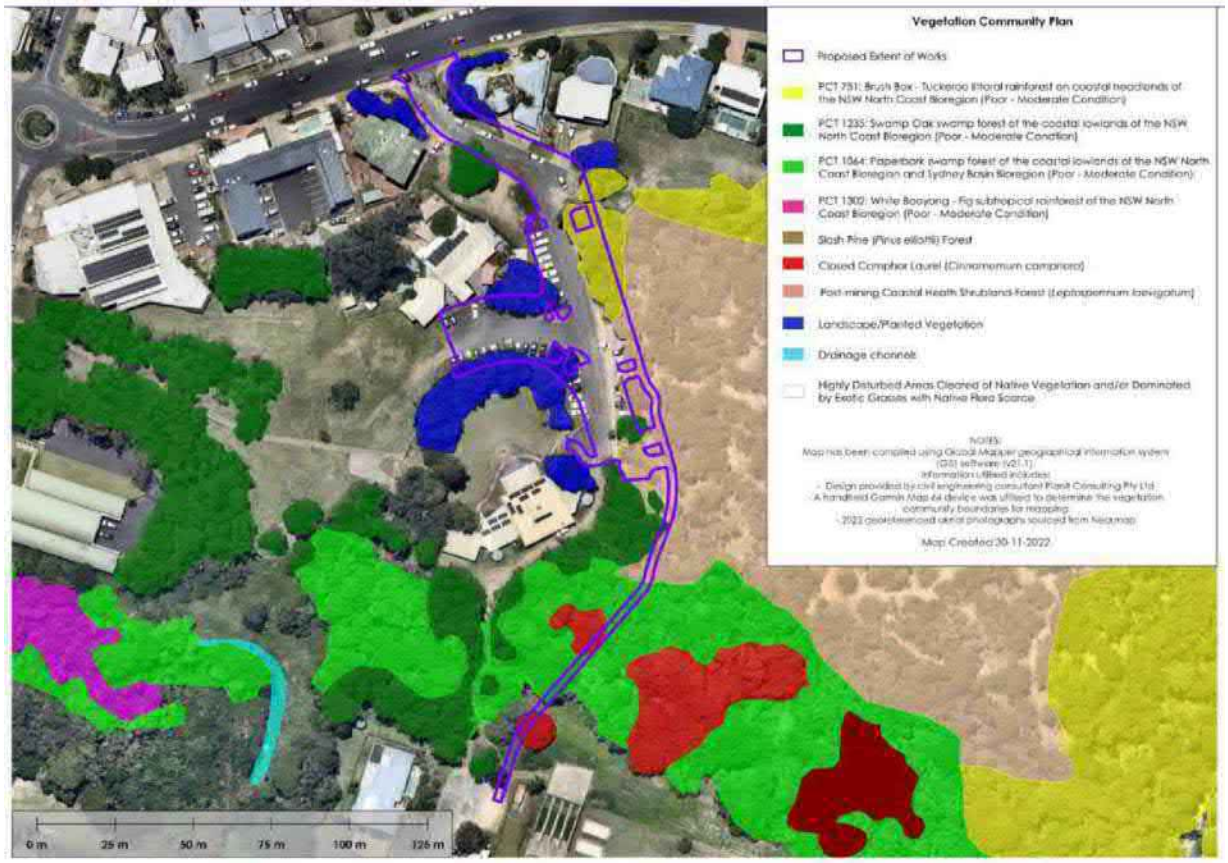


Plate 3. *Vegetation mapping - Stage 1 (Source: Planit 2022)*

4.2 Threatened communities

PCT 4034 is a degraded form of the threatened ecological community (TEC) 'Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions' as listed in the BC Act.

PCT 4034 is not characteristic of the EPBC Act listed equivalent TEC 'Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland' as condition thresholds are not met:

- The patch is least 0.5 ha and less than 2 ha ('Category C' vegetation), however this vegetation does not have a predominantly native understorey (ie. non-native species comprise less than 20% of total understorey vegetation cover).

4.3 Threatened flora

Two threatened flora species were recorded within the study area (refer **Figure 2**):

- Stinking Laurel (*Cryptocarya foetida*): numerous plants occur within the study area with a breakdown of plants as follows:
  - 11 plants occur in the area flanking the proposed walkway; most plants are immature saplings, with the largest being a small tree of ~4m height; all plants will be retained
  - A total of nine plants occur in the area of the proposed through road, with trees generally more developed and one large tree of ~8m present. All these trees will be removed for the proposed road construction
  - A further 7 plants occur in the locality (as part of the local population), within Sandhills estate (excluding the eastern portion).

While Stinking Laurel may occur relatively commonly within the locality (pers. obs.), the association with Swamp Oak forest is unusual. However the open and modified nature of this community coupled with evidence of a range of other native rainforest species indicated active regeneration is occurring via seed dispersing frugivorous birds. BioNet (confirmed) records of Stinking Laurel in the locality are shown at **Plate 4**.

The BDAR prepared by Planit Consulting (2023) for the Sandhills Stormwater Management Systems Project recorded 43 Stinking Laurel in the eastern portion of Sandhills Estate (refer **Plate 5**), further confirming that a substantial local population occurs. These records have not yet been incorporated into the BioNet database.

- Fine-leaved Tuckeroo (*Lepiderema pulchella*) – a single seedling occurs within disturbed Swamp Oak forest near the proposed walkway. The species is outside its geographic range (north of the Brunswick River).

4.4 Condition

As noted, vegetation is highly disturbed, weedy and degraded. Common weed species include Brazil Cherry, Winter senna, Ochna, Singapore daisy, Mock Orange and Small-leaved Privet.

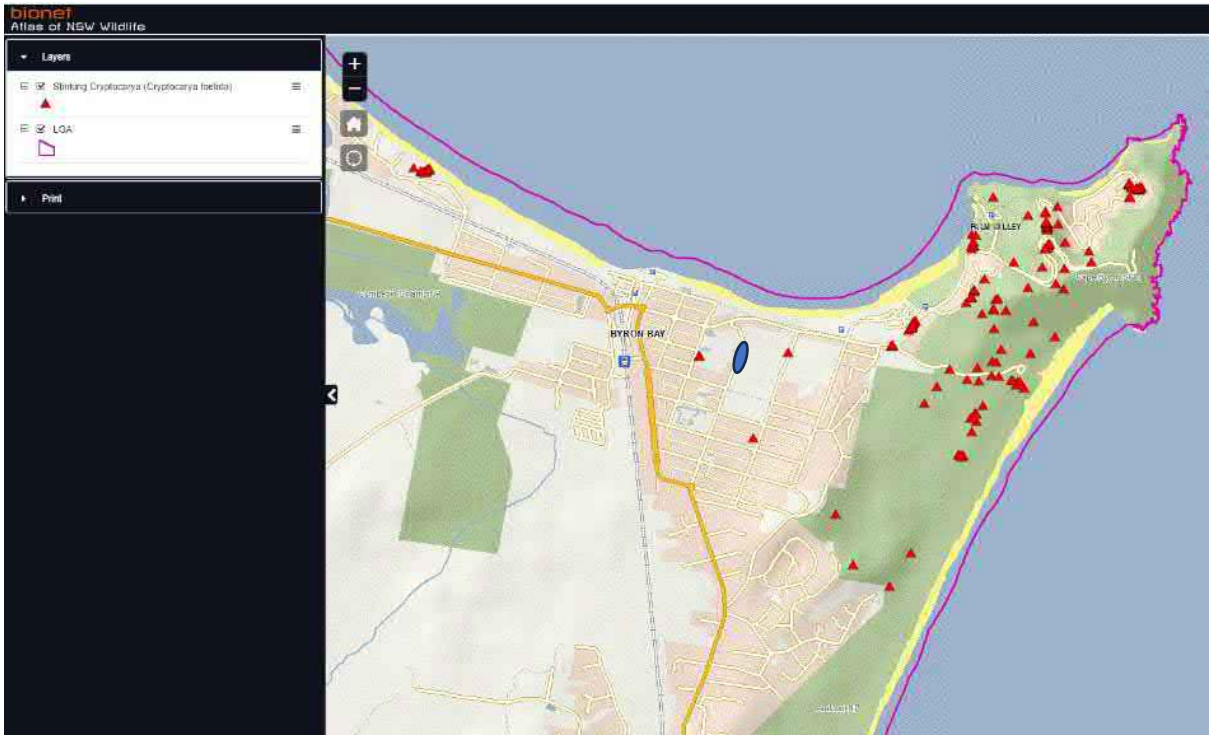


Plate 4. *Stinking Laurel – BioNet records (site shown by blue oval)*

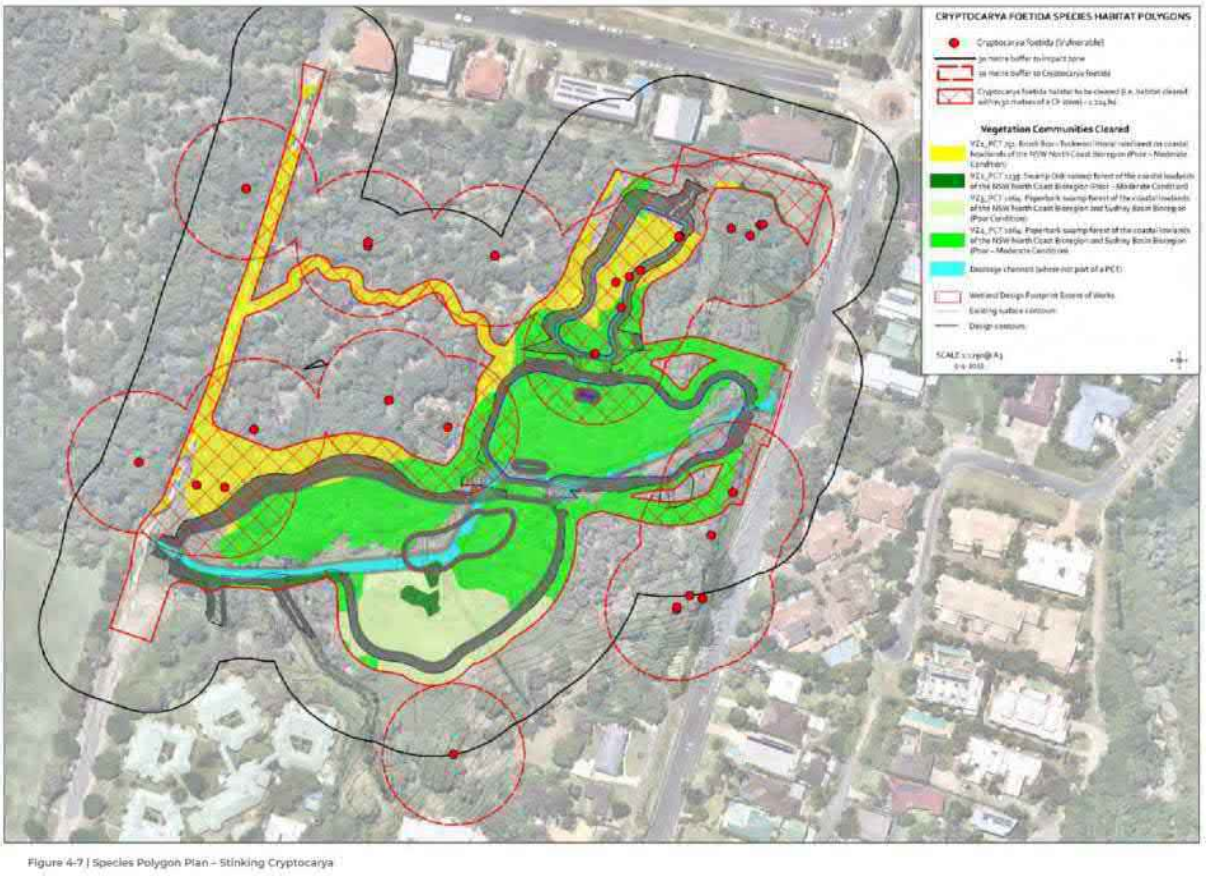
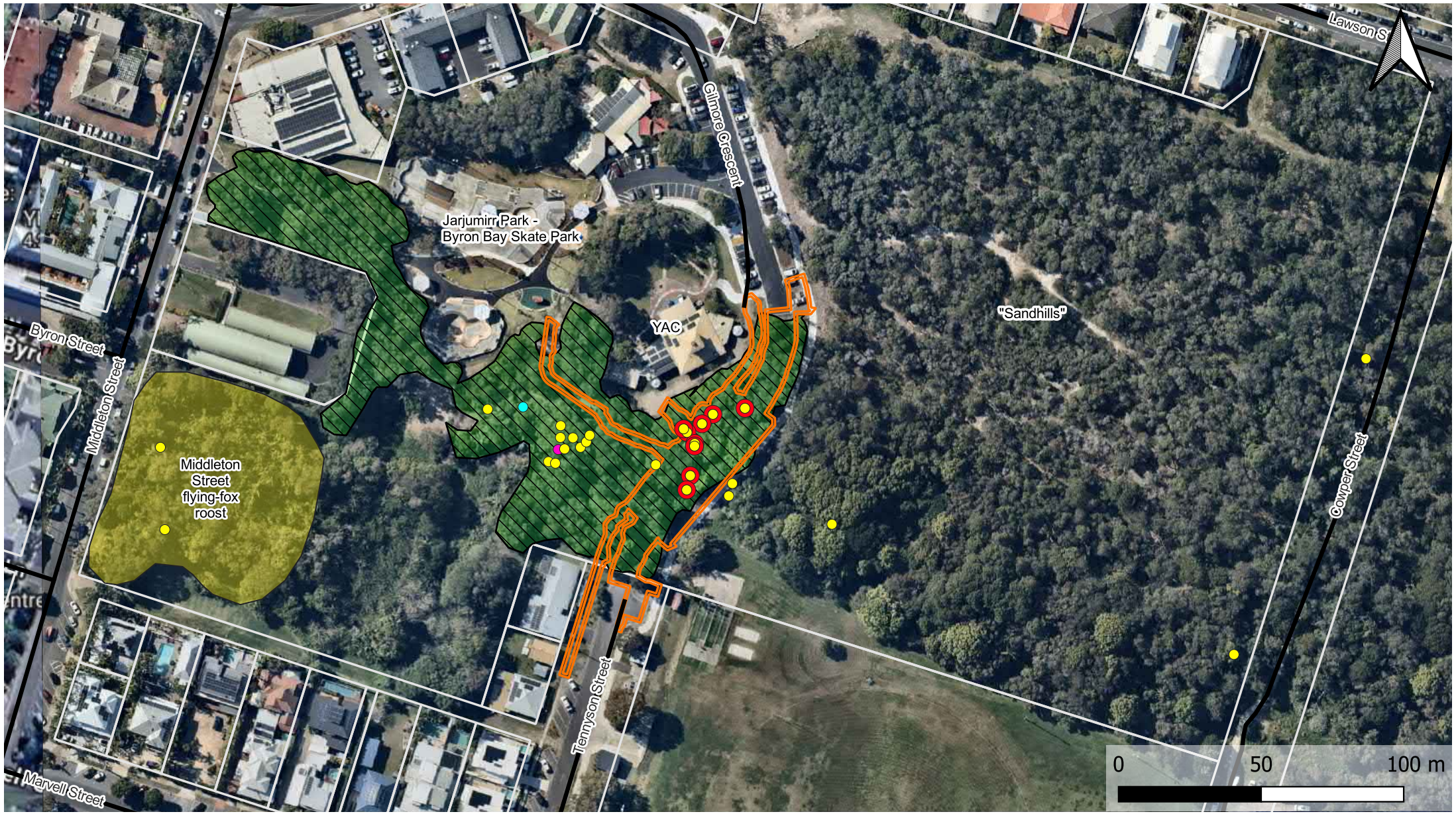


Figure 4-7 | Species Polygon Plan – Stinking Cryptocarya

Plate 5. *Stinking Laurel – records in east of Sandhills Estate (Source: Planit Consulting 2023)*



RECONECO

Figure 2: Vegetation, threatened flora and habitat constraints

Scale:1:2000
Date: Jan 2024
Author: LD

EPSG: 28356
Datum: GDA94

Legend

- Limit of works
- Cadastral boundaries
- Ibis nest tree (to be retained)
- Flying-fox roost (indicative)
- PCT 4034 Far North Swamp Oak Tuckeroo Swamp Fringe Forest
- TEC: Swamp Oak Floodplain Forest

Threatened flora

- Fine-leaved Tuckeroo
- Stinking Laurel
- Trees for removal

ReconEco makes every effort to ensure this map is free of errors but doesn't warrant the map or any data/features depicted are either spatially or temporally accurate or fit for a particular use. ReconEco provides this map without any warranty of any kind whatsoever, either express or implied.

5 Fauna Habitat Assessment

5.1 Fauna habitat values

The site locality provides moderate quality habitat due to the mix of several well-developed and structurally diverse communities. While a range of relatively common bird species were opportunistically observed during field assessment, this represents a small snapshot of the greater numbers which may occur during seasonal and climatic variations. A range of microbat species would be expected to use the site and surrounds as foraging habitat, including a number of threatened species. The fauna habitats presently are well described in the Planit Stage 1 assessment.

No hollow-bearing trees or Koala feed trees occur within the works footprint.

Signs of active fauna use include:

- An active Brush Turkey mound occurs within the proposed road footprint and birds forage freely within the study area and surrounds
- Several nests (with chicks) of White Ibis occur in a mature Swamp Oak within ~10m of the proposed walkway (refer **Figure 2**)
- The known flying-fox roost to the west adjacent to the Court House (refer **Figure 2**).

5.2 Threatened fauna

Apart from the nearby camp of Grey-headed Flying-foxes (refer **Figure 2**). no threatened fauna species were opportunistically recorded during field assessment.

The Stage 1 report (Planit 2022) recorded two threatened fauna species:

- Grey-headed Flying-fox: Roost site present within the western area of the Sandhills Precinct, proximate to the Court House.
- Little Bent-winged Bat: recoded foraging (Anabat)

Surveys for the Mitchells Rainforest Snail (MRS) did not detect the species, with the Stage 1 report stating:

> *It is considered that site falls within the known range of the snail. Although the species is known to occur within the locality (i.e. Byron bypass, Cumbebin Swamp Reserve etc.), no snails (or shells) were encountered during site survey efforts which included spotlighting and ground searches.*
>
> *The works footprint does not contain appropriate ground level structures suitable for this species and is dominated by weeds for the most part. Palms and Figs were also scarce. An Expert Report for the Mitchell's Rainforest Snail was prepared by Dr Parkyn (2021) for the Skatepark project immediately west of the works footprint. Dr Parkyn did not find any Mitchell's Rainforest Snails during survey works. He concluded that the site is neither 'primary' nor 'secondary' habitat for the species. It is considered unlikely that the proposal will significantly impact this species.*

This appraisal is agreed with for the same reasons.

5.3 Potential occurrence assessment

The Planit Stage 1 report completed a potential occurrence assessment and determined suitable habitat occurs for several threatened fauna to occur on an opportunistic or seasonal basis; these species were subject to a Test of Significance (ToS) as per s7.3 of the BC Act. The conclusions of the potential occurrence assessment and ToS are supported and these are not repeated.

6 Impact Assessment

6.1 Avoid and minimise

The proposal is examined with regard to the principle of 'avoid and minimise', as follows:

1. The walkway has been designed and sited to utilise an existing informal pathway and avoid adjacent Stinking Laurel
2. The road footprint has been minimised where possible – however due to the existing alignment of both the northern and southern ends of the joining roads, avoidance of HEV vegetation (and threatened flora habitat) is not possible.

6.2 Impacts

Biodiversity impacts of the proposal may include:

Direct (construction) impacts

- Loss of native vegetation:
  - An estimated 2300 m² of PCT 4034 (Swamp Oak Floodplain Forest TEC) will be removed
  - A further loss of 12 native trees >3 m height will occur for construction of the access pathway (refer **Table 6.1**).
- Loss of nine Stinking Laurel trees/saplings.
- Short term noise and disturbance to local fauna from plant, trucks and personnel.
- Potential for introduction of weed propagules during construction.

Table 6.1 *Trees requiring removal for walkway*

Botanical name	Common name	No.	Comments
Casuarina glauca	Swamp Oak	9	8 x semi-mature to matute trees; 1 x sapling
Cupaniopsis anacardioides	Tuckeroo	1	Immature tree of ~ 4 m height
Ficus fraseri	Sandpaper Fig	1	Immature tree of ~ 5 m height
Noteleaea longifolia	Mock Olive	1	Immature tree of ~ 2.5 m height
	TOTAL	**12**	

Indirect (operational) impacts

- Potential for weed invasion following works.
- Increased potential for roadkill due to new traffic flow – this may affect species such as water dragons, other reptiles and frogs. As the road speed will be a low speed urban road (50 km/hr). the potential for impacting ground dwelling mammals (eg. bandicoots, macropods) is relatively low.

6.3 Mitigation

The following prescriptions apply to avoid and minimise biodiversity impacts resulting from the proposal:

1. Minimise the extent of clearing wherever possible.
2. Prior to works the limits of clearing must be clearly defined by bunting or temporary fencing and these areas designated as 'no go' zones.
3. A pre-clearing survey must be completed by an ecologist or spotter-catcher prior to vegetation clearance in the event that fauna are present. Surveys may be required over several days depending on the project timing and program. The project ecologist shall advise the project superintendent on any measures taken to avoid any fauna features or on measures necessary to avoid any active nests/dreys or other features. Consideration of avoiding impacting the brush turkey mound will be necessary with regarding to breeding times and the project timeline.
4. Branches and woody debris within the clearing footprint shall be removed and relocated into adjacent vegetation/habitat) as part of the pre-clearing survey.
5. For all tree removal completed, material shall be chipped and mulch used in landscaping or sprayed into adjacent vegetation (or removed from site as last resort if necessary).

6. Weed hygiene measures must be practiced for the duration of the project to ensure propagules are not spread during clearing works.
7. Any post-works landscaping must utilise endemic species reflective of the vegetation community present. It is recommended that landscape plantings include Stinking Laurel as a feature species and plants are sourced locally or established from seed collected and grown up from trees in the locality.
8. A (temporary) fauna crossing sign should be installed for at least 12 months once the road is opened. The signs should be installed on either side of the new road and state: *"Caution: fauna crossing"* (or words of similar intention). BSC should consider the installation of traffic calming devices which may also be helpful in slowing traffic speeds which may further reduce fauna impacts.

BSC should also consider the option of translocating impacted Stinking Laurel into adjacent habitat within Sandhills Estate. While translocation is usually completed as a last resort, there are no other options available to preserve these trees within the project footprint. Of the of the nine trees impacted, eight trees are 5m or less in height and therefore suitable for translocation. While there is potential that some trees may not survive, the option is viable and could be readily achieved at a small scale. Discussion with local experts (Dr Andrew Benwell, Dr Barbara Stewart) should be completed to determine the viability of translocation if this option is pursued.

All other mitigation measures prescribed by Planit (2022) for the Stage 1 works are supported and should be implemented as necessary.

6.4 Compensation

The Planit Stage 1report recommended compensation works to be completed for Swamp Oak vegetation at a ratio of 10:1. This approach is supported. On this basis a total compensation area of 2.3 ha would be required to compensate for the loss of 2300 m² of PCT 4034. A further 120 trees require planting to offset the loss of trees identified in **Table 6.1** for the access pathway. This planting may be suitable as part of post construction landscaping.

7 Statutory Requirements

7.1 Introduction

The proposal requires assessment with regard to the following legislation/policies:

- *Biodiversity Conservation Act 2016*
- *SEPP (Resilience & Hazards) 2021*
- *Environment Protection and Biodiversity Conservation Act 1999*.

7.2 Biodiversity Conservation Act 2016 (BC Act)

Section 7.3 of the BC Act prescribes a test (the 'Test of Significance') for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. A Test of Significance has been completed for known threatened entities at the site – Stinking Laurel, Fine-leaved Tuckeroo, Swamp Oak Floodplain Forest (refer **Appendix D**).

NOTE: No assessment of other entities has been completed as threatened fauna have been adequately assessed in the biodiversity assessment for Stage 1 by Planit Consulting.

The results of the tests concluded that the proposal would not significantly affect threatened species or ecological communities, or their habitats. On this basis, the Biodiversity Offsets Scheme established in the BC Act is not triggered, and a *Biodiversity Development Assessment Report* (BDAR) is not required.

7.3 SEPP (Resilience & Hazards) 2021

The site contains Coastal Wetlands mapped under SEPP R&H 2021, with the works within the mapped proximity area (refer **Figure 1**). Section 2.8 of the Policy states that development consent must not be granted to development on land identified as "proximity area for coastal wetlands" or "proximity area for littoral rainforest" on the Coastal Wetlands and Littoral Rainforests Area Map unless the consent authority is satisfied that the proposed development will not significantly impact on:

a) the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or
b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.

The project would impact degraded and fragmented native vegetation, which while of conservation value, however would be unlikely to impact nearby Coastal Wetlands as the works would not substantially change the biophysical, hydrological or ecological integrity of the adjacent coastal wetland due to substantial separation/buffers and the quality of surface and ground water flows (as per engineering designs) would not be affected such that adjacent coastal wetlands would be negatively affected.

7.4 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act considers nine matters of national environmental significance (MNES):

- World heritage properties
- National heritage places
- Wetlands of international importance ('Ramsar' wetlands)
- Nationally threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mining)
- A water resource, in relation to coal seam gas development and large coal mining development.

Under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of national environmental significance (MNES) require approval from the Minister for the Environment. Based on a search using the PMST tool (refer **Appendix B**), MNES are summarised at **Table 7.1**.

The impacts of the proposal on MNES are not significant and referral of the project is not required.

Table 7.1 *MNES assessment*

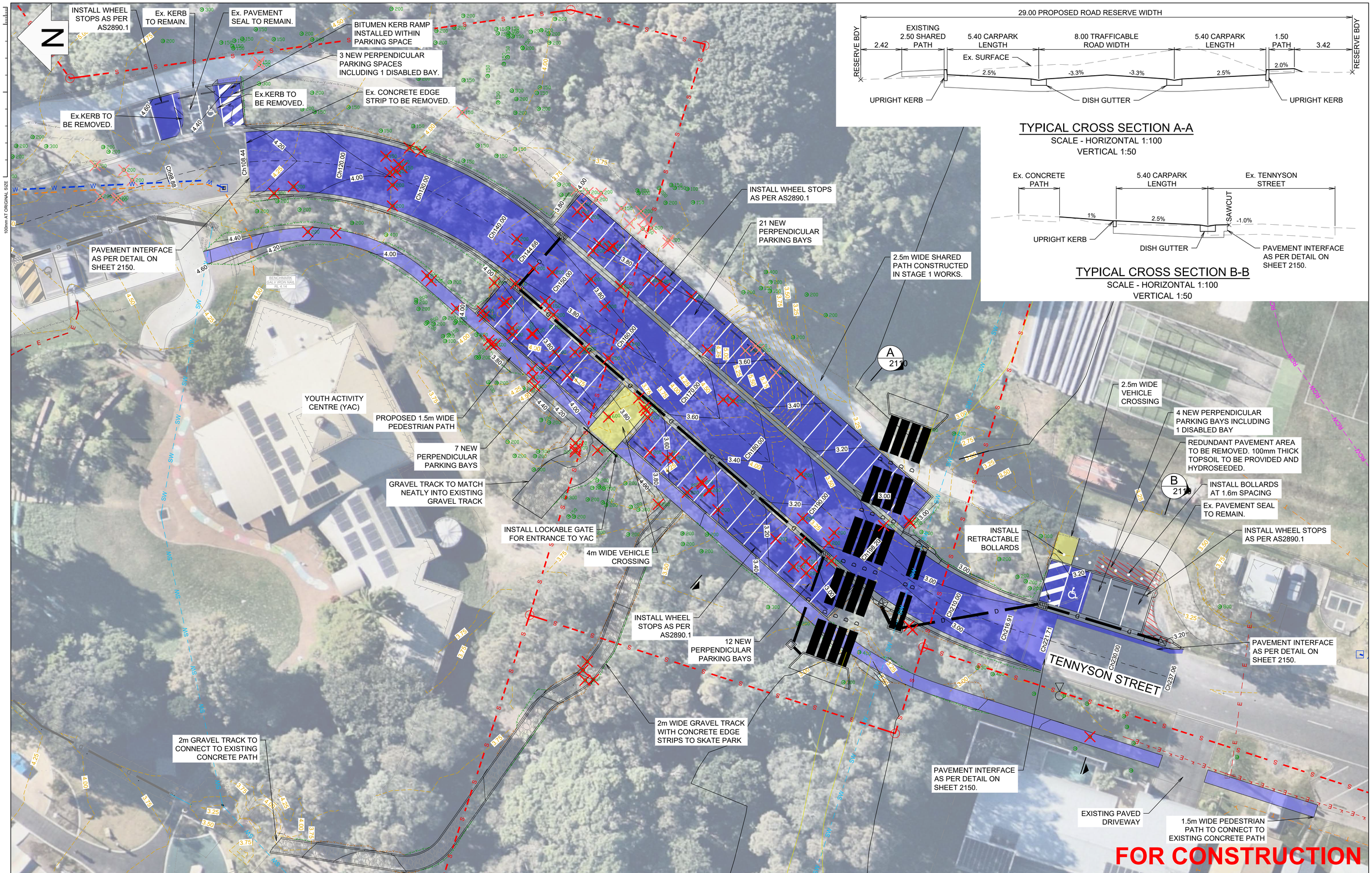
MNES	Impact
Any impact on a World Heritage property?	
No World Heritage properties occur within the locality.	Nil
Any impact on National heritage places?	
No National heritage places occur within the locality.	Nil
Any impact on wetlands of international importance?	
No wetlands of international importance occur within the locality.	Nil
Any impact on nationally threatened species and ecological communities?	
Potential habitat for seven threatened ecological communities (TECs) and 104 threatened species is identified within the locality. The threatened flora species Stinking Laurel occurs at the site and nine of these plants will be removed. As noted in the ToS, a small local population occurs, and the species would not be significantly impacted at a local geographic scale as a result of the works, as determined by the Impact Assessment at **Appendix E**. PCT 4034 is not characteristic of the EPBC Act listed TEC 'Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland' as condition thresholds are not met. Several listed threatened fauna species may use the subject site and surrounds on an opportunistic or seasonal basis (eg. Grey-headed Flying-fox); the works would not result in the removal of any important habitat for these species.	Low
Any impact on migratory species?	
Habitat for 62 migratory species is identified within the locality. The subject site is small in area and unlikely to provide significant for any migratory species in a local context, particularly given the substantial foraging habitats around Cape Byron.	Negligible
Any impact on Commonwealth marine areas?	
No Commonwealth marine areas occur within the locality.	Nil
Any impact on the Great Barrier Reef?	
Not applicable.	Nil
Does the activity involve a nuclear action (including uranium mining)?	
Not applicable.	Nil
Any impact on a water resource from coal seam gas development or a large coal mining development?	
Not applicable.	Nil

References

Planit Consulting (2022). *Biodiversity Assessment Report Gilmore Crescent, Byron Bay*. Report prepared for Byron Shire Council.

Planit Consulting (2023). *Biodiversity Development Assessment Report Sandhills Stormwater Management Systems Project*. Report prepared for Byron Shire Council.

Appendix A - Design



TYPICAL CROSS SECTION A-A

SCALE - HORIZONTAL 1:100
VERTICAL 1:50

TYPICAL CROSS SECTION B-B

SCALE - HORIZONTAL 1:100
VERTICAL 1:50

100mm AT ORIGINAL SIZE

SCALES:
0 2 4 8 12
Full Size 1:200 ; Half Size 1:400
Scale (m)

DO NOT SCALE FROM DRAWING

REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
00	IFC	27/09/24	NP	NP	CG	CG

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APPROVED BY: CESAR GIRALDO

DATE: 27/09/24

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PLANIT CONSULTING

CLIENT: BYRON SHIRE COUNCIL

LOCAL GOVERNMENT AUTHORITY: BYRON SHIRE COUNCIL

PROJECT: TENNYSON STREET EXTENSION

DRAWING TITLE: ROAD - LAYOUT PLAN

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J5772	1300	00

CAD FILE: C:\12DS\DATA\PLANITSYNJ7572 - SANDHILLS ESTATE_786\7 - ENGINEERING\7.4 DRAFTING\J7572 - GILMORE CRESCENT - DETAIL PLAN STAGE 2.DWG PLOTTED BY: NICK.PLETTING PLOT DATE: 27/09/2024 1:16:44 PM

Appendix B - BioNet/PMST Search Results

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -28.59 West: 153.57 East: 153.67 South: -28.69] returned a total of 3,828 records of 99 species.

Report generated on 14/07/2023 1:18 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Myobatrachidae	3137	*Crinia tinnula*		Wallum Froglet	V,P		102	
Animalia	Amphibia	Hylidae	3166	*Litoria aurea*		Green and Golden Bell Frog	E1,P	V	3	
Animalia	Amphibia	Hylidae	3202	*Litoria olongburensis*		Olongburra Frog	V,P	V	33	
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P	E	119	
Animalia	Reptilia	Cheloniidae	2007	*Chelonia mydas*		Green Turtle	V,P	V	118	
Animalia	Reptilia	Cheloniidae	2008	*Eretmochelys imbricata*		Hawksbill Turtle	P	V	33	
Animalia	Aves	Phaethontidae	0107	*Phaethon rubricauda*		Red-tailed Tropicbird	V,P	C,J	1	
Animalia	Aves	Columbidae	0025	*Ptilinopus magnificus*		Wompoo Fruit-Dove	V,P		8	
Animalia	Aves	Columbidae	0021	*Ptilinopus regina*		Rose-crowned Fruit-Dove	V,P		10	
Animalia	Aves	Columbidae	0023	*Ptilinopus superbus*		Superb Fruit-Dove	V,P		2	
Animalia	Aves	Podargidae	0314	*Podargus ocellatus*		Marbled Frogmouth	V,P		3	
Animalia	Aves	Apodidae	0334	*Hirundapus caudacutus*		White-throated Needletail	P	V,C,J,K	10	
Animalia	Aves	Diomedeidae	0931	*Thalassarche bulleri*		Buller's Albatross	P	V	1	
Animalia	Aves	Procellariidae	0929	*Macronectes giganteus*		Southern Giant Petrel	E1,P	E	39	
Animalia	Aves	Procellariidae	0937	*Macronectes halli*		Northern Giant-Petrel	V,P	V	6	
Animalia	Aves	Procellariidae	8684	*Pterodroma leucoptera leucoptera*		Gould's Petrel	V,P	E	1	
Animalia	Aves	Procellariidae	8993	*Pterodroma neglecta neglecta*		Kermadec Petrel (west Pacific subspecies)	V,P	V	1	
Animalia	Aves	Procellariidae	0955	*Pterodroma nigripennis*		Black-winged Petrel	V,P		1	
Animalia	Aves	Ciconiidae	0183	*Ephippiorhynchus asiaticus*		Black-necked Stork	E1,P		33	
Animalia	Aves	Ardeidae	0197	*Botaurus poiciloptilus*		Australasian Bittern	E1,P	E	3	
Animalia	Aves	Ardeidae	0196	*Ixobrychus flavicollis*		Black Bittern	V,P		14	
Animalia	Aves	Accipitridae	0226	*Haliaeetus leucogaster*		White-bellied Sea-Eagle	V,P		9	
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*		Little Eagle	V,P		1	
Animalia	Aves	Accipitridae	0230	*^^Lophoictinia isura*		Square-tailed Kite	V,P,3		2	
Animalia	Aves	Accipitridae	8739	*^^Pandion cristatus*		Eastern Osprey	V,P,3		24	
Animalia	Aves	Gruidae	0177	*Grus rubicunda*		Brolga	V,P		1	
Animalia	Aves	Rallidae	0053	*Amaurornis moluccana*		Pale-vented Bush-hen	V,P		20	
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*		Bush Stone-curlew	E1,P		9	
Animalia	Aves	Burhinidae	0175	*Esacus magnirostris*		Beach Stone-curlew	E4A,P		15	
Animalia	Aves	Haematopodidae	0131	*Haematopus fuliginosus*		Sooty Oystercatcher	V,P		3	
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*		Pied Oystercatcher	E1,P		36	
Animalia	Aves	Jacanidae	0171	*Irediparra gallinacea*		Comb-crested Jacana	V,P		14	
Animalia	Aves	Scolopacidae	0164	*Calidris canutus*		Red Knot	P	E,C,J,K	1	
Animalia	Aves	Scolopacidae	0161	*Calidris ferruginea*		Curlew Sandpiper	E1,P	CE,C,J,K	1	
Animalia	Aves	Scolopacidae	0165	*Calidris tenuirostris*		Great Knot	V,P	CE,C,J,K	3	
Animalia	Aves	Scolopacidae	0149	*Numenius madagascariensis*		Eastern Curlew	P	CE,C,J,K	5	
Animalia	Aves	Laridae	0972	*Gygis alba*		White Tern	V,P		1	
Animalia	Aves	Laridae	0120	*Onychoprion fuscata*		Sooty Tern	V,P		2	
Animalia	Aves	Laridae	9926	*Procelsterna cerulea*		Grey Ternlet	V,P		1	
Animalia	Aves	Laridae	0117	*Sternula albifrons*		Little Tern	E1,P	C,J,K	12	
Animalia	Aves	Cacatuidae	8862	*^Calyptorhynchus lathami lathami*		South-eastern Glossy Black-Cockatoo	V,P,2	V	5	
Animalia	Aves	Psittacidae	8028	*^Cyclopsitta diophthalma coxeni*		Coxen's Fig-Parrot	E4A,P,2	E	1	
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*		Little Lorikeet	V,P		2	
Animalia	Aves	Strigidae	0246	*^^Ninox connivens*		Barking Owl	V,P,3		1	
Animalia	Aves	Tytonidae	0252	*^^Tyto longimembris*		Eastern Grass Owl	V,P,3		13	
Animalia	Aves	Tytonidae	0250	*^^Tyto novaehollandiae*		Masked Owl	V,P,3		3	
Animalia	Aves	Tytonidae	9924	*^^Tyto tenebricosa*		Sooty Owl	V,P,3		2	
Animalia	Aves	Monarchidae	0376	*Carterornis leucotis*		White-eared Monarch	V,P		7	
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*		Spotted-tailed Quoll	V,P	E	3	
Animalia	Mammalia	Dasyuridae	1045	*Planigale maculata*		Common Planigale	V,P		15	
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*		Koala	E1,P	E	705	
Animalia	Mammalia	Potoroidae	1175	*Potorous tridactylus*		Long-nosed Potoroo	V,P	V	6	
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*		Grey-headed Flying-fox	V,P	V	60	
Animalia	Mammalia	Pteropodidae	1294	*Syconycteris australis*		Common Blossom-bat	V,P		7	
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*		Yellow-bellied Sheathtail-bat	V,P		1	
Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*		Southern Myotis	V,P		34	

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 14-Jul-2023

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	104
Listed Migratory Species:	62

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	3
Commonwealth Heritage Places:	2
Listed Marine Species:	91
Whales and Other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	7
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	8
Key Ecological Features (Marine):	None
Biologically Important Areas:	5
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In buffer area only
Grey box-grey gum wet forest of subtropical eastern Australia	Endangered	Community may occur within area	In buffer area only
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	In buffer area only
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
null			
Mordacia praecox			
Non-parasitic Lamprey, Precocious Lamprey [81530]	Endangered	Species or species habitat likely to occur within area	In buffer area only
BIRD			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Anthochaera phrygia](#) Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Botaurus poiciloptilus](#) Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
[Calidris canutus](#) Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calyptorhynchus lathami lathami](#) South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Climacteris picumnus victoriae](#) Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area	In feature area
[Cyclopsitta diophthalma coxeni](#) Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
[Diomedea antipodensis](#) Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
[Diomedea antipodensis gibsoni](#) Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Phoebetria fusca](#) Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
[Pterodroma leucoptera leucoptera](#) Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In feature area
[Pterodroma neglecta neglecta](#) Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
[Stagonopleura guttata](#) Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
[Sternula nereis nereis](#) Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche carteri](#) Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche cauta](#) Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
[Thalassarche impavida](#) Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
FISH			
[Epinephelus daemelii](#) Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Hippocampus whitei](#) White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In feature area
[Seriolella brama](#) Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
[Thunnus maccoyii](#) Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
FROG			
[Litoria olongburensis](#) Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Mixophyes fleayi](#) Fleay's Frog [25960]	Endangered	Species or species habitat may occur within area	In feature area
[Mixophyes iteratus](#) Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
INSECT			
[Argynnis hyperbius inconstans](#) Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Phyllodes imperialis smithersi](#) Pink Underwing Moth [86084]	Endangered	Species or species habitat known to occur within area	In buffer area only
MAMMAL			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus tridactylus Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Xeromys myoides](#) Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat may occur within area	In feature area
PLANT			
[Acronychia littoralis](#) Scented Acronychia [8582]	Endangered	Species or species habitat known to occur within area	In feature area
[Allocasuarina thalassoscopica](#) [21927]	Endangered	Species or species habitat known to occur within area	In feature area
[Arthraxon hispidus](#) Hairy-joint Grass [9338]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Baloghia marmorata](#) Marbled Balogia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Bosistoa transversa](#) Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Bulbophyllum globuliforme](#) Miniature Moss-orchid, Hoop Pine Orchid [6649]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Cryptocarya foetida](#) Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Cryptostylis hunteriana](#) Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
[Cynanchum elegans](#) White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In feature area
[Davidsonia jerseyana](#) Davidson's Plum [67219]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Davidsonia johnsonii Smooth Davidsonia, Smooth Davidson's Plum, Small-leaved Davidson's Plum [67178]	Endangered	Species or species habitat likely to occur within area	In feature area
Diploglottis campbellii Small-leaved Tamarind [21484]	Endangered	Species or species habitat likely to occur within area	In feature area
Elaeocarpus williamsianus Hairy Quandong [8956]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Endiandra floydii Floyd's Walnut, Crystal Creek Walnut [52955]	Endangered	Species or species habitat known to occur within area	In feature area
Endiandra hayesii Rusty Rose Walnut, Velvet Laurel [13866]	Vulnerable	Species or species habitat known to occur within area	In feature area
Floydia praealta Ball Nut, Possum Nut, Big Nut, Beefwood [15762]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Fontainea australis Southern Fontainea [24037]	Vulnerable	Species or species habitat may occur within area	In feature area
Gossia fragrantissima Sweet Myrtle, Small-leaved Myrtle [78867]	Endangered	Species or species habitat may occur within area	In buffer area only
Hicksbeachia pinnatifolia Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Leichhardtia longiloba listed as Marsdenia longiloba Clear Milkvine [91911]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area	In feature area
Ochrosia moorei Southern Ochrosia [11350]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Owenia cepiodora Onionwood, Bog Onion, Onion Cedar [11344]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat known to occur within area	In feature area
Randia moorei Spiny Gardenia [10577]	Endangered	Species or species habitat known to occur within area	In feature area
Rhodamnia maideniana Smooth Scrub Turpentine [20665]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Symplocos baeuerlenii Small-leaved Hazelwood, Shrubby Hazelwood [19010]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Syzygium hodgkinsoniae Smooth-bark Rose Apple, Red Lilly Pilly [3539]	Vulnerable	Species or species habitat known to occur within area	In feature area
Syzygium moorei Rose Apple, Coolamon, Robby, Durobby, Watermelon Tree, Coolamon Rose Apple [12284]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thesium australe](#) Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
[Vincetoxicum woollsii listed as Tylophora woollsii](#) [40080]	Endangered	Species or species habitat may occur within area	In feature area
REPTILE			
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Coeranoscincus reticulatus](#) Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Delma torquata](#) Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Congregation or aggregation known to occur within area	In feature area
[Eretmochelys imbricata](#) Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Lepidochelys olivacea](#) Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
SHARK			
[Carcharias taurus (east coast population)](#) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Galeorhinus galeus			
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Sphyrna lewini			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
SNAIL			
Thersites mitchellae			
Mitchell's Rainforest Snail [66774]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area	In feature area
Ardenna grisea			
Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area
Ardenna pacifica			
Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula albifrons Little Tern [82849]		Breeding likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche carteri			
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche cauta			
Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche salvini			
Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera borealis			
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera edeni			
Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
Balaenoptera physalus			
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Carcharhinus longimanus			
Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Congregation or aggregation known to occur within area	In feature area
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In feature area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
[Rhincodon typus](#) Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
[Sousa sahulensis as Sousa chinensis](#) Australian Humpback Dolphin [87942]		Species or species habitat known to occur within area	In feature area
Migratory Terrestrial Species			
[Cuculus optatus](#) Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat known to occur within area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
[Symposiachrus trivirgatus as Monarcha trivirgatus](#) Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [11303]	NSW	In feature area
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11302]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Commission [11299]	NSW	In buffer area only

Commonwealth Heritage Places [Resource Information]

Name	State	Status	Buffer Status
Historic			
Byron Bay Post Office	NSW	Listed place	In feature area
Cape Byron Lighthouse	NSW	Listed place	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
[Fregata ariel](#) Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
[Fregata minor](#) Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
[Macronectes giganteus](#) Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
[Macronectes halli](#) Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding likely to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalasseus bergii as Sterna bergii](#) Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
[Tringa nebularia](#) Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In feature area
Fish			
[Acentronura tentaculata](#) Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In feature area
[Campichthys tryoni](#) Tryon's Pipefish [66193]		Species or species habitat may occur within area	In feature area
[Corythoichthys amplexus](#) Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area	In feature area
[Corythoichthys ocellatus](#) Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area	In feature area
[Festucalex cinctus](#) Girdled Pipefish [66214]		Species or species habitat may occur within area	In feature area
[Filicampus tigris](#) Tiger Pipefish [66217]		Species or species habitat may occur within area	In feature area
[Halicampus grayi](#) Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In feature area
[Hippichthys cyanospilos](#) Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area	In feature area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In feature area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area	In feature area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In feature area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In feature area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area	In feature area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area	In feature area
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area	In feature area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area	In feature area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area	In feature area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In feature area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In feature area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In feature area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In feature area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In feature area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
Mammal			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In feature area
Reptile			
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Congregation or aggregation known to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area	In feature area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area	In feature area

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Sousa sahulensis Australian Humpback Dolphin [87942]		Species or species habitat known to occur within area	In feature area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Arakwal	National Park	NSW	In buffer area only
Cape Byron	State Conservation Area	NSW	In buffer area only
Cape Byron	Marine Park	NSW	In feature area
Cumbebin Swamp	Nature Reserve	NSW	In buffer area only
Hayters Hill	Nature Reserve	NSW	In buffer area only
Julian Rocks Nguthungulli	Nature Reserve	NSW	In buffer area only
Tyagarah	Nature Reserve	NSW	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Harvest Estate, West Byron Urban Release Area, Ewingsdale Road, Byron Bay, NSW	2018/8166	Controlled Action	Post-Approval	In buffer area only
Installation of three swing moorings in Byron Bay	2002/717	Controlled Action	Completed	In buffer area only
Not controlled action				
Byron Shire Council Sewage Treatment Plant Upgrade	2000/48	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Residential dwelling, 26 Shelley Drive	2004/1362	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Byron Bay Town Centre Bypass	2019/8562	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Byron Shire Bioenergy Facility	2021/8969	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed	In feature area

Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
Dolphins			
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur	In buffer area only
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Known to occur	In feature area
Marine Turtles			
Caretta caretta Loggerhead Turtle [1763]	Nesting	Known to occur	In feature area
Sharks			
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur	In feature area
Whales			
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur	In feature area

Bioregional Assessments

SubRegion	BioRegion	Website	Buffer Status
Clarence-Moreton	Clarence-Moreton	BA website	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Animalia	Mammalia	Vespertilionidae	1336	*Nyctophilus bifax*	Eastern Long-eared Bat	V,P		21
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P		5
Animalia	Mammalia	Miniopteridae	1346	*Miniopterus australis*	Little Bent-winged Bat	V,P		37
Animalia	Mammalia	Miniopteridae	3330	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P		8
Animalia	Mammalia	Muridae	1466	*Pseudomys gracilicaudatus*	Eastern Chestnut Mouse	V,P		2
Animalia	Mammalia	Dugongidae	1558	*Dugong dugon*	Dugong	E1,P		3
Animalia	Mammalia	Otariidae	1543	*Arctocephalus forsteri*	New Zealand Fur-seal	V,P		1
Animalia	Mammalia	Otariidae	1882	*Arctocephalus pusillus doriferus*	Australian Fur-seal	V,P		1
Animalia	Insecta	Noctuidae	I021	*Phyllodes imperialis southern subspecies*	Southern Pink Underwing Moth	E1	E	8
Animalia	Insecta	Nymphalidae	I024	*Argynnis hyperbius*	Laced Fritillary	E1	CE	1
Animalia	Gastropoda	Camaenidae	I002	*Thersites mitchellae*	Mitchell's Rainforest Snail	E1	CE	220
Plantae	Flora	Apocynaceae	1233	*Marsdenia longiloba*	Slender Marsdenia	E1	V	2
Plantae	Flora	Casuarinaceae	8980	*Allocasuarina defungens*	Dwarf Heath Casuarina	E1	E	1135
Plantae	Flora	Casuarinaceae	14655	*Allocasuarina thalassoscopica*			E	31
Plantae	Flora	Cunoniaceae	10943	*^Davidsonia jerseyana*	Davidson's Plum	E1,2	E	36
Plantae	Flora	Euphorbiaceae	9851	*Chamaesyce psammogeton*	Sand Spurge	E1		1
Plantae	Flora	Fabaceae (Caesalpinioideae)	1877	*Caesalpinia bonduc*	Knicker Nut	E1		1
Plantae	Flora	Fabaceae (Faboideae)	2833	*Desmodium acanthocladum*	Thorny Pea	V	V	1
Plantae	Flora	Fabaceae (Mimosoideae)	7757	*Archidendron hendersonii*	White Lace Flower	V		45
Plantae	Flora	Flacourtiaceae	3114	*Xylosma terrae-reginae*	Queensland Xylosma	E1		21
Plantae	Flora	Lauraceae	3477	*Cryptocarya foetida*	Stinking Cryptocarya	V	V	236
Plantae	Flora	Lauraceae	8948	*Endiandra floydii*	Crystal Creek Walnut	E1	E	35
Plantae	Flora	Lauraceae	3491	*Endiandra hayesii*	Rusty Rose Walnut	V	V	9
Plantae	Flora	Lauraceae	8480	*Endiandra muelleri subsp. bracteata*	Green-leaved Rose Walnut	E1		19
Plantae	Flora	Meliaceae	3682	*Owenia cepiodora*	Onion Cedar	V	V	5
Plantae	Flora	Menispermaceae	3691	*Tinospora tinosporoides*	Arrow-head Vine	V		15
Plantae	Flora	Myrtaceae	4283	*Rhodamnia rubescens*	Scrub Turpentine	E4A	CE	25
Plantae	Flora	Myrtaceae	4284	*Rhodomyrtus psidioides*	Native Guava	E4A	CE	24
Plantae	Flora	Myrtaceae	4290	*Syzygium hodgkinsoniae*	Red Lilly Pilly	V	V	9
Plantae	Flora	Myrtaceae	4292	*Syzygium moorei*	Durobby	V	V	38
Plantae	Flora	Orchidaceae	14732	*^Diuris byronensis*	Byron Bay Diuris	E1,P,2		61
Plantae	Flora	Orchidaceae	6672	*^Geodorum densiflorum*	Pink Nodding Orchid	E1,P,2		124
Plantae	Flora	Orchidaceae	6990	*^Oberonia complanata*	Yellow-flowered King of the Fairies	E1,P,2		1
Plantae	Flora	Orchidaceae	4480	*^Phaius australis*	Southern Swamp Orchid	E1,P,2	E	9
Plantae	Flora	Orchidaceae	7324	*^Pterostylis nigricans*	Dark Greenhood	V,P,2		26
Plantae	Flora	Polypodiaceae	8156	*^^Drynaria rigidula*	Basket Fern	E1,3		2
Plantae	Flora	Proteaceae	5354	*Floydia praealta*	Ball Nut	V	V	3
Plantae	Flora	Proteaceae	5372	*Grevillea hilliana*	White Yiel Yiel	E1		1
Plantae	Flora	Proteaceae	9680	*Macadamia integrifolia*	Macadamia Nut		V	6
Plantae	Flora	Proteaceae	5446	*Macadamia tetraphylla*	Rough-shelled Bush Nut	V	V	16
Plantae	Flora	Psilotaceae	8164	*^^Psilotum complanatum*	Flat Fork Fern	E1,3		1
Plantae	Flora	Rutaceae	6457	*Acronychia littoralis*	Scented Acronychia	E1	E	15
Plantae	Flora	Rutaceae	8658	*Melicope vitiflora*	Coast Euodia	E1		2

Appendix C - Photographs

	Plate 1. View of walkway to the skatepark through disturbed Swamp Oak forest; white stakes delineate construction footprint.
	Plate 2. Proposed walkway (white stake) with nearby Stinking Laurel (circled, and with pink flagging tape)
	Plate 3. Group of mature Swamp Oak (circled) to be removed for proposed walkway (white stake)

	Plate 4. Recently constructed footpath, with all adjacent vegetation to the west (RHS; circled) to be removed
	Plate 5. Southern end of Gilmore Crescent looking south - all vegetation to circled to be removed

Appendix D – Test of Significance (BC Act)

The threatened species test of significance (ToS) is used to determine if a development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. The ToS is applied as part of the Biodiversity Offsets Scheme (BOS) entry requirements and is set out in s.7.3 of the *Biodiversity Conservation Act 2016*.

A ToS has been completed for the following threatened entities based on field assessment with regard to the amended design:

Threatened Ecological Communities:

- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions ('Swamp Oak Floodplain Forest')

Threatened flora:

- Stinking Laurel
- Fine-leaved Tuckeroo.

NOTE: No assessment of other entities has been completed as threatened fauna have been adequately assessed in the biodiversity assessment for Stage 1 by Planit Consulting, and the additional incremental loss of habitat for Stage 2 of the project is relatively low in the context of the site and the existing landscape/.

Test of significance for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Stinking Laurel: nine trees of the 27 trees recorded will require removal, representing the loss of ~33% of the immediate local population. The remaining 18 trees retained are likely to provide a sufficient basis for the sustaining of the local population of the species, and it would be expected that ongoing recruitment of new individuals of the species would occur via dispersal from the larger proximate and well established population of the species within the nearby Cape Byron State Conservation Area. As noted, 43 Stinking Laurel trees were recorded in the eastern portion of Sandhills Estate (refer **Plate 5**; Planit 2023).

On this basis it is considered unlikely that the proposal would contribute to placing the local population of Stinking Laurel at increased risk of extinction.

Fine-leaved Tuckeroo: the single seedling is set back from the works footprint and will be retained in-situ.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Swamp Oak Floodplain Forest

The proposed works would result in the removal of ~ 2300 m² of degraded Swamp Oak Floodplain Forest. This loss is unlikely to affect the extent or composition of this community to the extent that it is likely to be placed at risk of extinction as:

- Impacts to ~ 2300 m² of highly degraded Swamp Oak Floodplain Forest ('SOFF') is relatively low in the context of areas of SOFF retained adjacent (to the west) of the study area (refer **Figure 2**).
- Retained areas of SOFF within the site would not be adversely modified or ecologically compromised.

(c) In relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

Stinking Laurel: as noted, ~ 33% of the immediate local population of the species within ~300m of the proposal would be impacted. The habitat in which the impacted trees occur (Swamp Oak forest – PCT 4034) is atypical for the species. Better quality habitat for the species occurs in the eastern portion of Sandhills Estate (and where 43 specimens of the species have been recorded (refer Planit 2023).

Fine-leaved Tuckeroo: the single seedling is set back from the works footprint and will be retained in-situ.

Swamp Oak Floodplain Forest (SOFF): Degraded SOFF is in poor condition, and represents a (low quality) portion (est. 25 – 30%) of this community in the eastern part of Sandhills Estate.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

Stinking Laurel: the proposal will fragment PCT 4034 from adjacent habitat to the east; however the separation from the road would not impact upon dispersal mechanisms (frugivorous birds) which would limit the potential for Stinking Laurel to establish in the locality.

Fine-leaved Tuckeroo: the single seedling is set back from the works footprint and will be retained in-situ.

Swamp Oak Floodplain Forest (SOFF): the site is already fragmented/disturbed from previous historic works and informal access pathways. However, the proposal will result in further permanent fragmentation of this community. Given that other patches of PCT 4034 are scattered and fragmented and that sufficient areas

retained to permit ongoing recruitment of keystone species, it would be unlikely this fragmentation would place increased pressure in the resilience of SOFF at a local scale or reduce opportunities for dispersal or recruitment.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

Stinking Laurel: The habitat to be removed is atypical for the species and is of relatively low importance at a local scale, when better quality habitat occurs (eg. in the east of Sandhills Estate). The loss of habitat for the project is unlikely to be of significant important for the long term survival of Stinking Laurel in the locality.

Fine-leaved Tuckeroo: the single seedling is set back from the works footprint and will be retained in-situ.

Swamp Oak Floodplain Forest (SOFF): SOFF at the site is highly degraded dominated by woody weeds and has no opportunity to expand further given spatial constraints – this habitat is not important in a local context.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

There are no declared areas of outstanding biodiversity value within Byron LGA.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to increase the impact of a key threatening process.

A key threatening process is listed in the *Biodiversity Conservation Act 2016* if it:

- adversely affects threatened species or ecological communities
- could cause species or ecological communities to become threatened.

The current list of key threatening processes (KTPs) and whether the proposal constitutes any KTPs, is summarised in **Table D.1**.

Table D.1 *Key Threatening Process assessment*

Key Threatening Processes (as per Schedule 4 of the BC Act)	***Does the development or activity contribute towards a key threatening process?***		
	Likely	***Possibly***	***Unlikely***
Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*)			✓
Alteration of habitat following subsidence due to longwall mining			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Anthropogenic climate change			✓
Bush rock removal			✓
Clearing of native vegetation	✓		
Competition and grazing by the feral European rabbit (*Oryctolagus cuniculus*)			✓
Competition and habitat degradation by feral goats (C*apra hircus*)			✓
Competition from feral honey bees (*Apis mellifera*)			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Forest Eucalypt dieback associated with over-abundant psyllids and bell miners			✓
Habitat degradation and loss by Feral Horses			✓
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition			✓
Herbivory and environmental degradation caused by feral deer			✓
Importation of red imported fire ants (*Solenopsis invicta*)			✓
Infection by psittacine circoviral (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae			✓
Introduction of the large earth bumblebee (*Bombus terrestris*)			✓
Invasion and establishment of exotic vines and scramblers			✓

Key Threatening Processes (as per Schedule 4 of the BC Act)	***Does the development or activity contribute towards a key threatening process?***		
	Likely	***Possibly***	***Unlikely***
Invasion and establishment of Scotch broom (*Cytisus scoparius*)			✓
Invasion and establishment of the cane toad (*Bufo marinus*)			✓
Invasion of native plant communities by African Olive *Olea europaea L. subsp. cuspidata*			✓
Invasion, establishment and spread of *Lantana camara*			✓
Invasion of native plant communities by *Chrysanthemoides monilifera* (bitou bush and boneseed)			✓
Invasion of native plant communities by exotic perennial grasses			✓
Invasion of the yellow crazy ant (*Anoplolepis gracilipes* (Fr. Smith) into NSW			✓
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants			✓
Loss of hollow-bearing trees			✓
Loss or degradation (or both) of sites used for hill-topping by butterflies			✓
Predation and hybridisation of feral dogs (*Canis lupus familiaris*)			✓
Predation by the European red fox (*Vulpes vulpes*)			✓
Predation by the feral cat (*Felis catus*)			✓
Predation by *Gambusia holbrooki* (plague minnow or mosquito fish)			✓
Predation by the ship rat (*Rattus rattus*) on Lord Howe Island			✓
Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)			✓
Removal of dead wood and dead trees	✓		

The proposal is characteristic of the following KTPs:

- Clearing of native vegetation: As noted, up to 12 native trees would be removed in addition to an area of ~ 2300m² of PCT 4034 which is in a highly disturbed condition.
- Removal of dead wood and dead trees: minor woody debris maybe removed for the works; this will be relocated into adjacent vegetation to serve as habitat.

Conclusion:

The proposal is unlikely to result in a significant impact on the any of the entities assessed. Consequently, further consideration in the form of a BDAR is not required.

Appendix E – Significant Impact Assessment (EPBC Act)

This Significant Impact Assessment has been prepared in accordance with the *Matters of National Environmental Significance Significant Impact Guidelines* (v1.1; DoE 2013) on the basis of nine Stinking Laurel (Vulnerable) being impacted by the Activity.

The Significant Impact Guidelines (SIG) assesses species and communities under their relevant listing criteria (ie. vulnerable, endangered, critically endangered). A Test of Significance has been completed for the Stinking Laurel as per BC Act requirements (refer **Appendix D**). However, significant impact criteria differ between the two Acts; on this basis the Stinking Laurel is assessed under EPBC Act requirements.

Definitions: A 'population of a species' is an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

- geographically distinct regional population, or collection of local populations, or
- a population, or collection of local populations, that occurs within a particular bioregion.

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- **key source populations either for breeding or dispersal**
- **populations that are necessary for maintaining genetic diversity, and/or**
- **populations that are near the limit of the species range.**

Significant Impact Assessment - Vulnerable species listed in the EPBC Act

Significant impact criteria: An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population of a species*
- *reduce the area of occupancy of an important population*
- *fragment an existing important population into two or more populations*
- *adversely affect habitat critical to the survival of a species*
- *disrupt the breeding cycle of an important population*
- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*
- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*
- *introduce disease that may cause the species to decline, or*
- *interfere substantially with the recovery of the species.*

As noted, nine trees of the 27 Stinking Laurel recorded will require removal, representing the loss of ~33% of the immediate local population. A further 43 specimens of the species have also been recorded in the eastern portion of Sandhills Estate (Planit 2023). BioNet records further indicate a well established population of the species within the nearby Cape Byron State Conservation Area.

Based on the species large geographic range (Fraser Island and east of Gympie to south to Iluka) and the relative commonality of local records, Stinking Laurel within the study area are not considered to represent an 'important population' (as defined in the EPBC Act).

An assessment of the potential impact of the Activity on the Stinking Laurel with reference to the significant impact criteria follows (overleaf).

Is there possibility that the activity will:

- ***lead to a long-term decrease in the size of an important population of a species?***

An important population is not present.

- ***reduce the area of occupancy of an important population?***

An important population is not present.

- ***fragment an existing important population into two or more populations?***

An important population is not present.

- ***adversely affect habitat critical to the survival of a species?***

The habitat affected is relatively small in the context of the locality and forms a negligible component of potential habitat in the locality for the Stinking Laurel.

- ***disrupt the breeding cycle of an important population?***

n/a - important population not present.

- ***modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?***

The habitat affected is relatively small in area, atypical for the species, highly degraded and forms a minor component of potential habitat in the locality for the Stinking Laurel.

- ***result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?***

The proposed works are unlikely to establish invasive species to the detriment of Stinking Laurel in the study area.

- ***introduce disease that may cause the species to decline?***

The proposed works are unlikely to introduce disease to the detriment of the Stinking Laurel.

- ***interfere substantially with the recovery of the species?***

The proposal would not interfere with the recovery of the species due to the modest scale of the works in a local context.

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Biodiversity Assessment

Tennyson Street – lighting and utilities

Prepared for: Planit Consulting
Date: June 2025

RECONECO

This report has been prepared for the use of the stated client and for the specific purpose described in the introduction and is not to be used for any other purpose or by any other person or business entity. ReconEco accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this report in contravention of the terms of this disclaimer.

Due consideration has been given to site conditions and to appropriate legislation and documentation available at the time of preparation of the report. As these elements are liable to change over time, the report is to be considered current at the time of preparation only.

The report relies on information supplied by the client and on findings obtained using accepted survey and assessment methodologies. The specific survey methodology utilised is described in the relevant section of the report.

While due care was taken during field survey and subsequent report preparation, ReconEco accepts no responsibility for any omissions that may have occurred due to the nature of the survey methodology.

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Biodiversity Assessment Method (BAM) accredited assessor (BAAS18055)

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11/06/2025	V3 (amended final)	I. Colvin	Sean Cochran (Planit Consulting)

Executive Summary

ReconEco Pty Ltd has been engaged by Planit Consulting to complete a biodiversity assessment to assess biodiversity impacts resulting from the installation of street lighting as an additional impact to the approved road construction between Gilmore Crescent and Tennyson Street, Byron Bay (currently in progress).

This assessment supports a Review of Environmental Factors (REF) prepared in accordance with requirements of part 5 of the *Environmental Planning and Assessment Act 1979*.

A summary of biodiversity matters is as follows:

- The site comprises highly disturbed land adjacent to stands of Swamp Oak forest (PCT 4034 Far North Swamp Oak-Tuckeroo Swamp Fringe Forest), Paperbark forest (PCT 4004 Northern Melaleuca quinquenervia Swamp Forest) and post mining regeneration.
- PCT 4034 is characteristic of the threatened ecological community (TEC) 'Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions' as listed in the BC Act. PCT 4004 represents the TEC 'Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions'.
- One threatened flora species occurs within the project footprint (Stinking Laurel *Cryptocarya foetida*); two trees occur within close to the southern trenching location but will be retained; one tree will require minor pruning.
- One threatened fauna species was recorded (a camp of Grey-headed Flying-foxes occurs nearby); it is unlikely the additional works would affect this camp.
- The proposed works may require the removal of native vegetation/habitat as follows:
  - 15 native trees >3 m in height
  - Approx. 20m² of a small isolated patch of PCT 4043 may be impacted.

The proposal was assessed under the following statutory/policy requirements:

- *Biodiversity Conservation Act 2016* (BC Act): a test of significance completed under s7.3 of the BC Act determined that the proposal would be unlikely to result in significant biodiversity impacts and a BDAR is not required on this basis.
- SEPP (Resilience & Hazards) 2021: the proposal is unlikely to result in deleterious impacts to nearby coastal wetlands.
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act): matters of national environmental significance (MNES) in the EPBC Act have been reviewed and assessed. The impacts of the proposal on MNES are not significant and referral of the project is not required.

As a result of this assessment, no further assessment or requirements apply.

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1 Introduction & Background

1.1 Introduction

ReconEco Pty Ltd has been engaged by Planit Consulting to complete a biodiversity assessment to assess biodiversity impacts resulting from the installation of street lighting as an additional impact to the approved road construction project between Gilmore Crescent and Tennyson Street, Byron Bay (currently in progress).

The aim of this assessment is to:

1. Identify the biodiversity values of the site, including:
   - vegetation communities and their condition
   - threatened flora species* and their habitats
   - threatened ecological communities (TECs)*
   - habitat for threatened fauna*
   - significant habitat features (eg. koala habitat trees, hollow bearing trees, microbat roosting habitat)
   - significant aquatic habitat.
2. Assess the proposal against relevant statutory requirements
3. Prescribe a range of mitigation measures to avoid or minimise biodiversity impacts.

**Biodiversity Conservation Act 2016* (BC Act), *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.2 Background

ReconEco prepared a biodiversity assessment to support the Gilmore Crescent Stage 2 project in 2024 and identified a number of biodiversity issues and constraints. The REF for the Gilmore Crescent Stage 2 project has been determined and works are currently in progress and vegetation clearing has been completed.

This assessment provides assessment of additional impacts not considered under the project. Potential fauna habitat constraints and impacts of the project (as a whole) have been documented previously for Stage 1 and these are not reproduced or discussed further in detail.

1.3 The site

The site comprises the road reserve of Tennyson Street which abouts Lots 7 & 8 DP1036196 to the east, known as 'Sandhills Estate' which is Crown Land under the management of BSC (refer **Figure 1**). Coastal Wetlands mapped under SEPP (Resilience & Hazards) 2021 occur in the western portion of the site; the proposed works are within the 100m proximity buffer to these wetlands (refer **Figure 1**).

For the purpose of this report, the focus is on the Tennyson Street road reserve only; no assessment has been completed for other parts of the site.

1.4 The proposal

The proposal ('the Activity') involves the installation of street lighting and associated trenching and utilities upgrades. The proposal requires minor vegetation clearing to allow for the installation of these utilities.

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Figure 1: Site Plan

ReconEco makes every effort to ensure this map is free of errors but doesn't warrant the map or any data/features depicted are either spatially or temporally accurate or fit for a particular use. ReconEco provides this map without any warranty of any kind whatsoever, either express or implied.

Scale:1: 1000
Date: June 2025
Author: SO
EPSG: 28356
Datum: GDA94

Legend

- Road
- Tennyson St extension (under construction)
- Cadastral boundaries

Coastal Wetlands

- Coastal Wetlands
- Proximity Area for Coastal Wetlands

2 Methodology

The methodology for this assessment has included both a desktop review and field survey.

2.1 Desktop Review

A range of online databases and information sources were searched to inform the assessment including:

- Atlas of NSW Wildlife (BioNet) database to identify confirmed records of threatened species within the locality (10km x 10km area centred on the site); refer **Appendix A**
- Protected Matters Search Tool (PMST) to determine any Matters of National Environmental Significance (MNES) within a 5km radius of the site; refer **Appendix A**
- Fisheries NSW Spatial Data Portal
- Council online mapping
- Previous biodiversity assessments (Planit etc).

2.2 Field Survey

Field assessment was completed by an experienced ecologist on 29/05/2025, following surveyor peg out/marking of the trenching locations for easy identification. Field survey included:

- Targeted searches for threatened flora (namely Stinking Laurel *Cryptocarya foetida*)
- Identification of trees likely to require removal or have impacts to the tree protection zone (TPZ)

Photographs from the field survey are provided at **Appendix B**.

Survey limitations

Field assessment did not include targeted fauna surveys due to previous comprehensive surveys by Planit Consulting (2022) and Dr Jonathon Parkyn (2022). Rather, a habitat assessment was undertaken to identify habitat features/values on the site and determine the suitability of the site for occupancy by any threatened species known or likely to occur on the site and in surrounding landscape.

A summary of previous survey effort by Planit for Stage 1 of the project is provided at **Table 2.1**.

Table 2.1 *Targeted fauna survey summary (Source: Planit 2022)*

Survey technique	Details
Diurnal Surveys	
Binocular search and identification of all fauna Bird identification surveys	5 x dawn/mid-morning (30 minutes) and 4 x dusk (4 x 45 minutes)
Ground track/trace survey	Opportunistically performed during other survey works
Diurnal frog-call recognition and identification	Opportunistically performed during other survey works
Ground strata searches and rock/timber/leaf litter rolls and examination for reptiles, frogs, Coastal petaltail and Mitchell's rainforest snail	5 x 30 minutes during the middle of the day or night (for Mitchell's Rainforest Snail), opportunistic during all other survey works
Spot Assessment Technique (SAT) for Koala faecal pellets per Phillips and Callaghan (2011)	3 x SAT sites surveyed
Opportunistic microbat roost searches	
Camera trap survey	14 motion triggered trail cameras (ScoutGuard) placed within the study area for 34 days
Nocturnal Surveys	
Audible survey for calls, scratching and landings Spotlighting survey	1-2 researchers over 4 nights for 120 minutes each night
Naked eye observation utilising dawn/dusk/moon light for bats and fauna returning to potential nest/shelter areas	Four dusk/evenings

Survey technique	Details
Passive acoustic survey	A songmeter SM4 was deployed between dusk and dawn for 34 nights at 4 different locations
Microbat (Anabat) survey	1-2 devices for 34 nights at five locations
Amphibian nocturnal searches adjacent to drainage lines and swamp forests	Four nights proximate to drainage lines and wetlands
Camera trap survey	14 motion triggered trail cameras (ScoutGuard) placed within the study area for 34 nights
Call playback survey	Various species; 5 dawn/early mornings and 4 dusks and nights

3 Desktop Review

Results of the desktop review are summarised in **Table 3.1**.

Table 3.1 *Desktop review assessment*

Resource	Results
BioNet database (*10km x 10km search centred on the site; refer* ***Appendix A***)	Confirmed records of 33 threatened flora and 78 threatened fauna. Potential habitat for several TECs.
Protected Matters Search Tool (PMST) (*search of 5km radius from the site; refer* ***Appendix A***)	Potential habitat for 109 threatened species, 7 TECs and 59 migratory species.
Biodiversity Values Map	The development footprint does not contain BV land, however connected vegetation within 100m to the west is mapped as BV land consistent with SEPP Coastal Wetlands mapping (refer **Figure 1**).
IBRA region and subregion	The site lies within the Burringbar-Conondale Ranges subregion of the South East Queensland IBRA region (Thackway & Cresswell, v7).
Mitchell landscape	The site lies within the Byron - Tweed Alluvial Plains of the SEQ Clarence Basin. Attributes include: *Channels, floodplain, terraces and estuary of the Tweed River and other coastal streams on Quaternary alluvium, general elevation 0 to 50m, local relief 15m. Uniform brown earths and structured brown clays on floodplains. Brown texture-contrast soil with high organic content on terrace remnants. Most of the valley is cleared but contained subtropical closed forest with; white booyong (Argyrodendron trifoliolatum), red cedar (Toona australis), and retains many rare species such as heart-leaved bosistoa (Bosistoa selwynii), velvet laurel (Endiandra hayesii), red-fruited ebony (Diospyros mabacea) and southern fontainea (Fontainea australis). Dry coastal hardwood forest on the terraces and slopes including; cabbage gum (Eucalyptus amplifolia), forest red gum (Eucalyptus tereticornis), broad-leaved apple (Angophora subvelutina), river oak (Casuarina cunninghamiana), silky oak (Grevillea robusta), rough-barked apple (Angophora floribunda), native teak (Flindersia australis), coastal grey box (Eucalyptus bosistoana), pink bloodwood (Corymbia intermedia), spotted gum (Corymbia maculata), grey ironbark (Eucalyptus paniculata), broad-leaved paperbark (Melaleuca quinquenervia), blackwood (Acacia melanoxylon) and black she-oak (Casuarina litoralis).*
Soils (eSPADE v2.2)	The site occurs on the Tyagarah soil landscape (eSPADE v2.2); attributes include: Landscape: sediment basins of mixed estuarine and aeolian origin forming level to gently undulating plains. Relief is <3 m, elevation <5 m and slopes <1%. Extensively cleared open- and closed-forest. Soils: deep (>150 cm), moderately well-drained minimal Prairie Soils near basaltic areas. Deep (>150 cm), well-drained Podzols and Acid Peats (O) near barrier systems. Deep (>200 cm), well-drained Podzols and Siliceous Sands in landscape variant tyb and deep (>200 cm), poorly drained Peaty Podzols near Tuckean soil landscape Limitations: very strongly acid, permeable, often waterlogged soils of low fertility and low waterholding capacity with localised salinity. Permanently high watertables and moderate wind erosion hazard.
Acid Sulfate Soils Risk (SEED)	The study area is mapped as L2 - Low probability of occurrence of acid sulfate soil 1-3m below ground surface.
Fisheries NSW Spatial Data Portal	No aquatic habitat is present within the study area.
SEPP (Resilience & Hazards) 2021	The study site is within the proximity area of coastal wetlands (refer **Figure 1**).

Resource	Results
Council mapping	Byron Council online mapping depicts vegetation at the site as being of high environmental value (HEV); refer **Plate 1**. Councils online mapping also depicts a flying fox camp to the east adjacent to Middleton Street (the 'Middleton Street camp'); refer **Plate 2**.
Byron Coast Comprehensive Koala Plan of Management	The site is not within a mapped Koala Management Precinct. None of the vegetation within the study area is mapped as potential Koala habitat.
NSW State Vegetation Type Map	Mapped Plant Community Types (PCT) at and adjacent to the site include: • PCT 3988 Far North Mesophyll Paperbark Swamp Forest • PCT 3989 Far North Paperbark Fern Swamp Forest • PCT 3553 Northern Sands Bloodwood-Swamp Turpentine Forest • PCT 4004 Northern *Melaleuca quinquenervia* Swamp Forest.

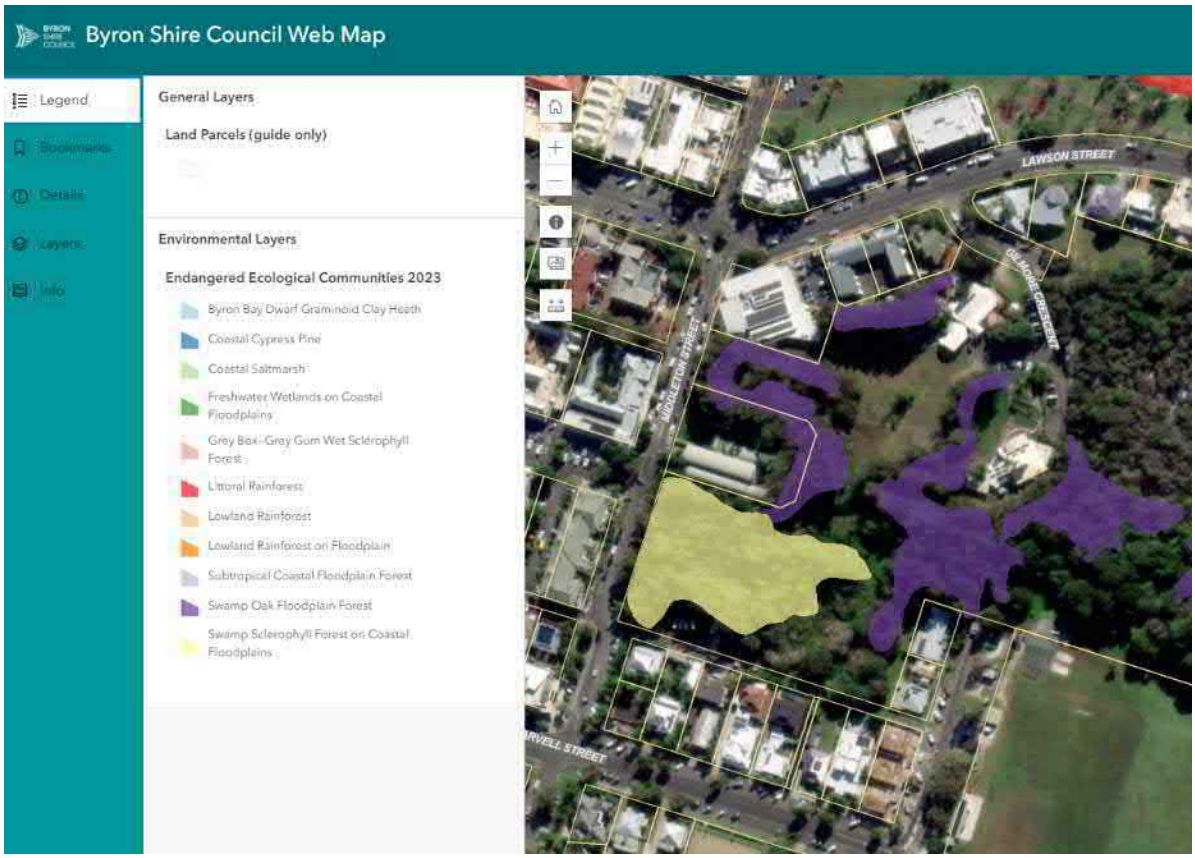


***Plate 1**. Screenshot from Byron Shire Council intramaps depicting threatened ecological community Swamp Oak Floodplain Forest (purple) and Swamp Sclerophyll Forest on Coastal Floodplain (yellow)*

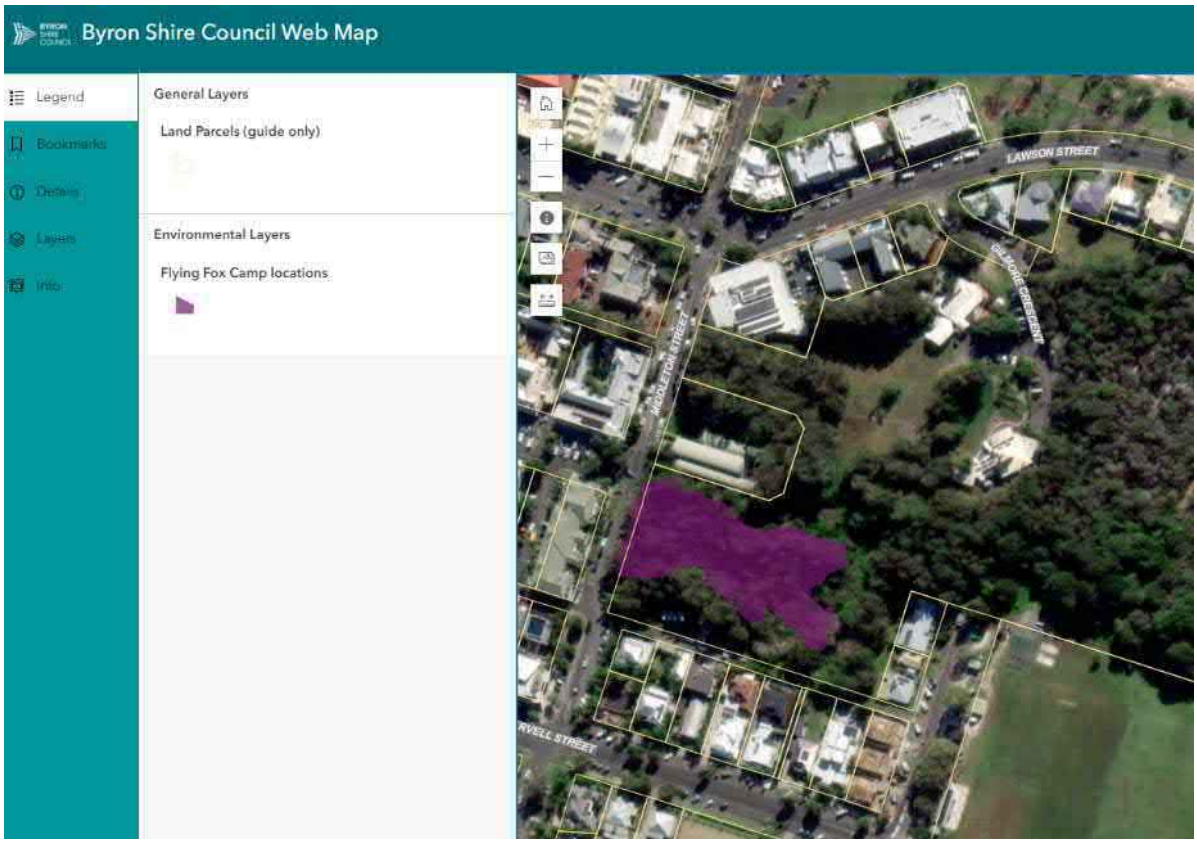


***Plate 2**. Screenshot from Byron Shire Council intramaps depicting Middleton Street flying-fox camp*

4 Vegetation Assessment

4.1 Vegetation

Vegetation at and adjacent to the site comprises degraded swamp forest dominated by Swamp Oak (*Casuarina glauca*) and/or Broad-leaved Paperbark (*Melaleuca quinquenervia*). Other vegetation includes landscape and street tree plantings in addition to post-mining regeneration in the Sandhills site.

Vegetation formerly within the Tennyson Street corridor (and assessed by ReconEco for the Stage 2 works) has been cleared and the road extension is currently under construction.

Vegetation communities and equivalent Plant Community Types (PCTs) at the site are described in **Table 4.1**. Previous vegetation mapping by Planit (2022) for the Stage 1 works is provided at **Plate 4**; note that PCTs have been revised since this time and PCT 1235 in the Planit mapping is equivalent to PCT 4034, while PCT 1064 is equivalent to PCT 4004.

Revised vegetation mapping is provided at **Figure 2** which simplifies polygons of weedy vegetation and applies PCT at a broader scale.

Table 4.1 *Plant community types (PCTs)*

	Description	Equivalent PCT
1	Swamp sclerophyll forest dominated by Swamp Oak (*Casuarina glauca*) with infrequent Tuckeroo (*Cupaniopsis anacardioides*) and other common rainforest species.	PCT 4034 Far North Swamp Oak-Tuckeroo Swamp Fringe Forest
2	Swamp sclerophyll forest dominated by Broad-leaved Paperbark (*Melaleuca quinquenervia*) with occasional rainforest species; Camphor Laurel* dominates some areas.	PCT 4004 Northern Melaleuca quinquenervia Swamp Forest
3	Grassland/disturbed: disturbed areas dominated by exotic grasses.	n/a

*introduced species

4.2 Threatened communities

PCT 4034 is a degraded form of the threatened ecological community (TEC) 'Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions' as listed in the BC Act.

PCT 4034 is not characteristic of the EPBC Act listed equivalent TEC 'Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland' as condition thresholds are not met:

- The patch is least 0.5 ha and less than 2 ha ('Category C' vegetation), however this vegetation does not have a predominantly native understorey (ie. non-native species comprise less than 20% of total understorey vegetation cover).

PCT 4004 represents a is a degraded form of the TEC 'Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions'. PCT 4004 is not characteristic of the EPBC Act listed equivalent TEC 'Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland' as condition thresholds are not met.

4.3 Threatened flora

One threatened flora species occurs within/proximate to the works footprint (refer **Figure 2**):

- Stinking Laurel (*Cryptocarya foetida*): two plants occur at the southern of the site (east side of Tennyson Street; refer **Figure 2**); numerous plants are known from the immediate site (as documented in ReconEco, 2024).

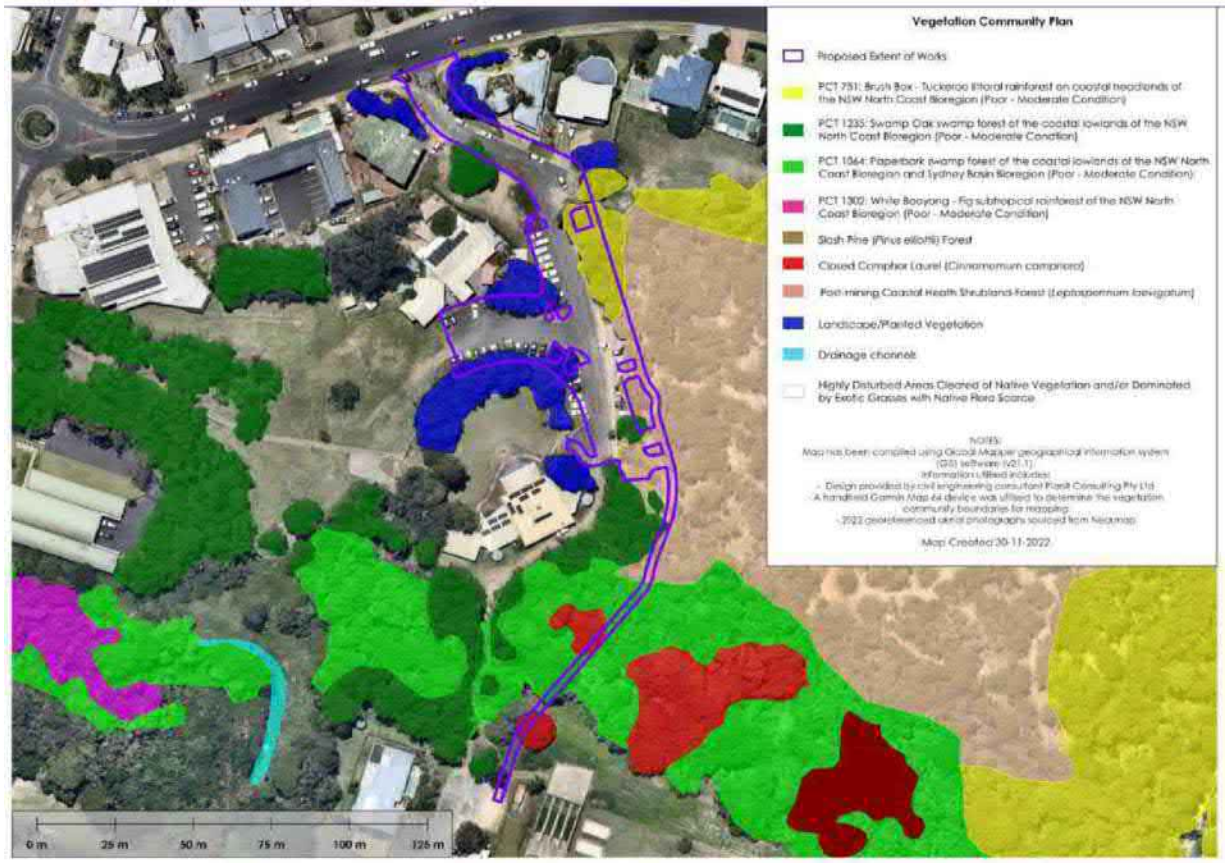
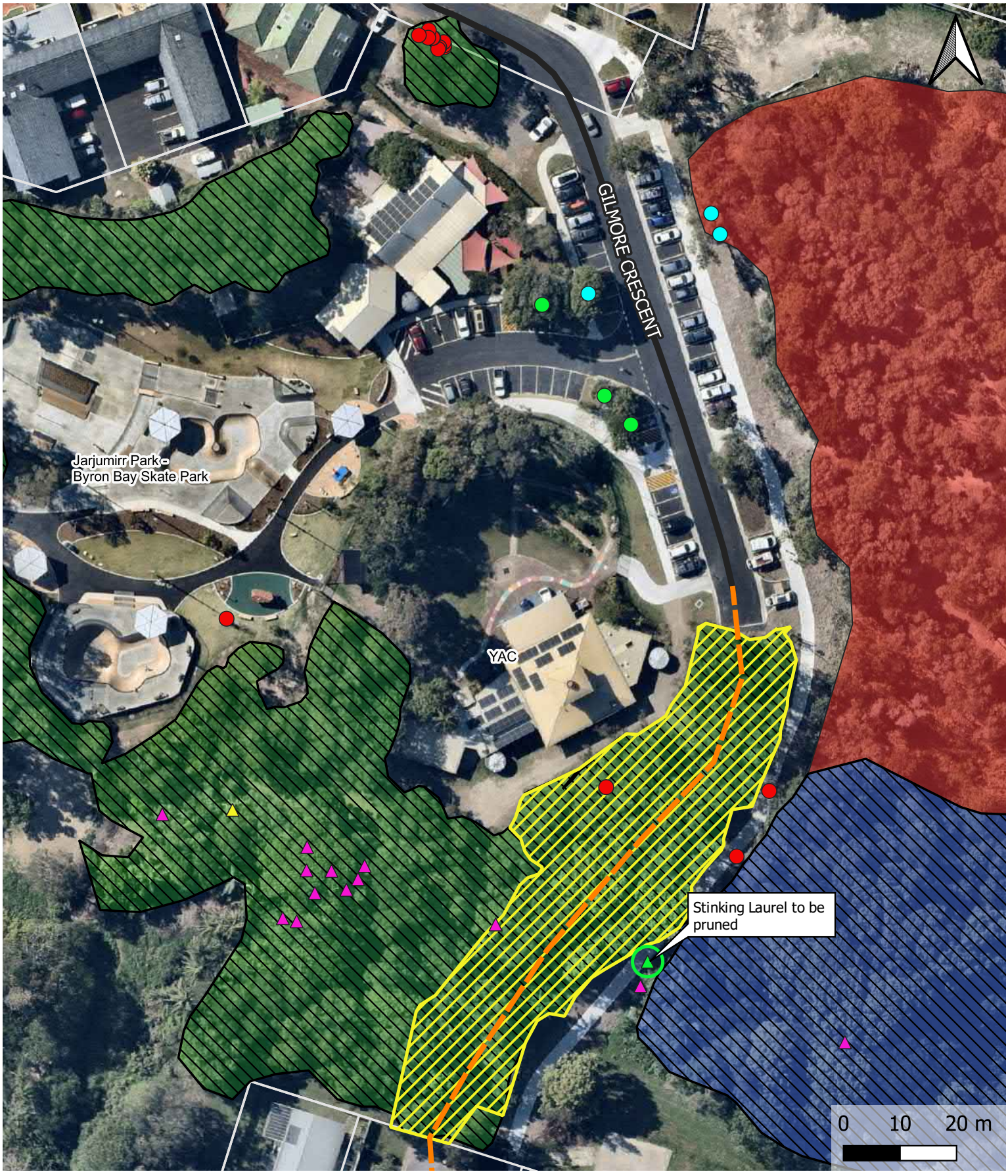


Plate 3. *Vegetation mapping - Stage 1 (Source: Planit 2022)*

4.4 Condition

As noted, vegetation is disturbed, weedy and degraded. Common weed species Winter Senna, Ochna and pasture grasses.



RECONECO

Figure 2: Amended vegetation, threatened flora and habitat constraints

ReconEco makes every effort to ensure this map is free of errors but doesn't warrant the map or any data/features depicted are either spatially or temporally accurate or fit for a particular use. ReconEco provides this map without any warranty of any kind whatsoever, either express or implied.

Scale:1: 1000
Date: June 2025
Author: SO
EPSG: 28356
Datum: GDA94

Legend

Tennyson St extension (under construction)

Removed vegetation

Vegetation

- PCT 4004 Northern Melaleuca quinquenervia Swamp Forest
- PCT 4034 Far North Swamp Oak-Tuckeroo Swamp Fringe Forest
- Post-mining Coastal Heath Shrubland
- TEC: Swamp Oak Floodplain Forest

Threatened flora

- Fine-leaved Tuckeroo (retain)
- Stinking Laurel (retain)
- Stinking Laurel (prune)

Additional trees impacts

- Remove
- Prune
- TPZ impacts

5 Fauna Habitat Assessment

5.1 Fauna habitat values

The site locality provides moderate quality habitat due to the mix of several well-developed and structurally diverse communities. While a range of relatively common bird species were opportunistically observed during field assessment, this represents a small snapshot of the greater numbers which may occur during seasonal and climatic variations. A range of microbat species would be expected to use the site and surrounds as foraging habitat, including a number of threatened species. The fauna habitats present are well described in the Planit Stage 1 assessment.

No hollow-bearing trees or Koala feed trees occur within the works footprint.

Signs of active fauna use observed by ReconEco (2024) include:

- An active Brush Turkey mound occurs within the proposed road footprint and birds forage freely within the study area and surrounds
- Several nests (with chicks) of White Ibis occur in a mature Swamp Oak within ~10m of the proposed walkway (refer **Figure 2**)
- The known flying-fox roost to the west adjacent to the Court House (refer **Plate 2**).

5.2 Threatened fauna

Apart from the nearby camp of Grey-headed Flying-foxes, no threatened fauna species were opportunistically recorded. The Stage 1 report (Planit 2022) recorded two threatened fauna species:

- Grey-headed Flying-fox: Roost site present within the western area of the Sandhills Precinct, proximate to the Court House.
- Little Bent-winged Bat: recoded foraging (Anabat)

Surveys for the Mitchells Rainforest Snail (MRS) did not detect the species, with the Stage 1 report stating:

> *It is considered that site falls within the known range of the snail. Although the species is known to occur within the locality (i.e. Byron bypass, Cumbebin Swamp Reserve etc.), no snails (or shells) were encountered during site survey efforts which included spotlighting and ground searches.*
>
> *The works footprint does not contain appropriate ground level structures suitable for this species and is dominated by weeds for the most part. Palms and Figs were also scarce. An Expert Report for the Mitchell's Rainforest Snail was prepared by Dr Parkyn (2021) for the Skatepark project immediately west of the works footprint. Dr Parkyn did not find any Mitchell's Rainforest Snails during survey works. He concluded that the site is neither 'primary' nor 'secondary' habitat for the species. It is considered unlikely that the proposal will significantly impact this species.*

This appraisal is agreed with for the same reasons.

5.3 Potential occurrence assessment

The Planit Stage 1 report completed a potential occurrence assessment and determined suitable habitat occurs for several threatened fauna to occur on an opportunistic or seasonal basis; these species were subject to a Test of Significance (ToS) as per s7.3 of the BC Act. The conclusions of the potential occurrence assessment and ToS are supported and these are not repeated.

6 Impact Assessment

6.1 Avoid and minimise

The proposal adheres to the principle of 'avoid and minimise', as the light pole locations and associated trenching has been sited to be close to the edge of the existing footpath to minimise encroachment into adjacent vegetation/habitat.

6.2 Impacts

Biodiversity impacts of the proposal may include:

Direct (construction) impacts

- Loss of native vegetation:
  - Loss of 15 native trees >3 m height at scattered locations (refer **Table 6.1, Figure 2**)
  - Pruning of one Stinking Laurel to accommodate lighting pole #7
  - Pruning of three planted native trees – one Weeping Lilly Pilly at Sandhills daycare centre; 2 x Blue Lilly Pilly on the western road verge (refer **Figure 2**)
- Landscaping impacts:
  - Loss of a small (2m) planted Lemon Myrtle (*Backhousia citriodora*) in the skatepark
  - Root zone impacts to a Golden Penda*(*Xanthostemon chrysanthus*) outside the daycare centre
  - Pruning of a Mango tree on the western road verge
- Short term noise and disturbance to local fauna from plant and personnel.
- Potential for introduction of weed propagules during construction.

Table 6.1 *Impacted native trees*

Botanical name	Common name	No.	Comments
Melaleuca quinquenervia	Broad-leaved Paperbark	2	Directly impacted near L6
Banksia integrifolia	Coast Banksia	1	Indirectly affected (TPZ incursions) near L3
Casuarina glauca	Swamp Oak	1	Indirectly affected (TPZ incursions) near L3
Casuarina glauca	Swamp Oak	6	Immature trees of ~ 3 m height at northern pit
Casuarina glauca	Swamp Oak	3	Trees between 1-14cm dbh at northern pit
Casuarina glauca	Swamp Oak	1	Indirectly affected (TPZ incursions) at northern pit
Melaleuca quinquenervia	Broad-leaved Paperbark	1	Isolated tree indirectly affected (TPZ incursions) on western road verge
	TOTAL	**15**	

Indirect (operational) impacts

- Potential for weed invasion following works.

6.3 Mitigation

The following prescriptions apply to avoid and minimise biodiversity impacts resulting from the proposal:

1. Minimise the extent of tree clearing wherever possible.
2. Prior to works the limits of clearing must be clearly defined by bunting or temporary fencing and these areas designated as 'no go' zones.
3. For all tree removal completed, material shall be chipped and mulch used in landscaping or sprayed into adjacent vegetation (or removed from site as last resort if necessary).
4. Weed hygiene measures must be practiced for the duration of the project to ensure propagules are not spread during clearing works.

6.4 Compensation

To mitigate the vegetation clearing associated with the proposed development and achieve no net loss of biodiversity, compensatory planting is recommended generally in accordance with the Byron Shire Development Control Plan 2014 Chapter F1 *Tree and Vegetation Management*.

7 Statutory Requirements

7.1 Introduction

The proposal requires assessment with regard to the following legislation/policies:

- *Biodiversity Conservation Act 2016*
- *SEPP (Resilience & Hazards) 2021*
- *Environment Protection and Biodiversity Conservation Act 1999*.

7.2 Biodiversity Conservation Act 2016 (BC Act)

Section 7.3 of the BC Act prescribes a test (the 'Test of Significance') for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. A Test of Significance has been completed for known threatened entities at/proximate to the works – Stinking Laurel, Swamp Oak Floodplain Forest, Swamp Sclerophyll Forest (refer **Appendix C**).

NOTE: No assessment of other entities has been completed as threatened fauna have been adequately assessed in the biodiversity assessment for Stage 1 by Planit Consulting.

The results of the tests concluded that the proposal would not significantly affect threatened species or ecological communities, or their habitats. On this basis, the Biodiversity Offsets Scheme established in the BC Act is not triggered, and a *Biodiversity Development Assessment Report* (BDAR) is not required.

7.3 SEPP (Resilience & Hazards) 2021

The site contains Coastal Wetlands mapped under SEPP R&H 2021, with the works within the mapped proximity area (refer **Figure 1**). Section 2.8 of the Policy states that development consent must not be granted to development on land identified as "proximity area for coastal wetlands" or "proximity area for littoral rainforest" on the Coastal Wetlands and Littoral Rainforests Area Map unless the consent authority is satisfied that the proposed development will not significantly impact on:

a) the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or
b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.

The project would impact degraded and fragmented native vegetation, which while of conservation value, however would be unlikely to impact nearby Coastal Wetlands as the works would not substantially change the biophysical, hydrological or ecological integrity of the adjacent coastal wetland due to substantial separation/buffers and the quality of surface and ground water flows (as per engineering designs) would not be affected such that adjacent coastal wetlands would be negatively affected.

7.4 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act considers nine matters of national environmental significance (MNES):

- World heritage properties
- National heritage places
- Wetlands of international importance ('Ramsar' wetlands)
- Nationally threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mining)
- A water resource, in relation to coal seam gas development and large coal mining development.

Under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of national environmental significance (MNES) require approval from the Minister for the Environment. Based on a search using the PMST tool (refer **Appendix A**), MNES are summarised at **Table 7.1**.

The impacts of the proposal on MNES are not significant and referral of the project is not required.

Table 7.1 *MNES assessment*

MNES	Impact
Any impact on a World Heritage property?	
No World Heritage properties occur within the locality.	Nil
Any impact on National heritage places?	
No National heritage places occur within the locality.	Nil
Any impact on wetlands of international importance?	
No wetlands of international importance occur within the locality.	Nil
Any impact on nationally threatened species and ecological communities?	
Potential habitat for seven threatened ecological communities (TECs) and 109 threatened species is identified within the locality. The threatened flora species Stinking Laurel occurs at the site and two trees adjacent to the works would be retained. PCT 4034 is not characteristic of the EPBC Act listed TEC 'Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland' as condition thresholds are not met. Several listed threatened fauna species may use the subject site and surrounds on an opportunistic or seasonal basis (eg. Grey-headed Flying-fox); the works would not result in the removal of any important habitat for these species.	Low
Any impact on migratory species?	
Potential habitat for 59 migratory species is identified within the locality. The subject site is small in area and unlikely to provide significant for any migratory species in a local context, particularly given the substantial foraging habitats around Cape Byron.	Negligible
Any impact on Commonwealth marine areas?	
No Commonwealth marine areas occur within the locality.	Nil
Any impact on the Great Barrier Reef?	
Not applicable.	Nil
Does the activity involve a nuclear action (including uranium mining)?	
Not applicable.	Nil
Any impact on a water resource from coal seam gas development or a large coal mining development?	
Not applicable.	Nil

References

Planit Consulting (2022). *Biodiversity Assessment Report Gilmore Crescent, Byron Bay*. Report prepared for Byron Shire Council.

Planit Consulting (2023). *Biodiversity Development Assessment Report Sandhills Stormwater Management Systems Project*. Report prepared for Byron Shire Council.

ReconEco (2024). *Biodiversity Assessment Gilmore Crescent – Stage 2*. Report to Planit Consulting.

Appendix A - BioNet/PMST Search Results

and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Licensed Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Plants in selected area
Report generated on 30/05/2025 11:52 AM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Plantae	Flora	Apocynaceae	1233	*Marsdenia longiloba*		Slender Marsdenia	E1	V	2	
Plantae	Flora	Casuarinaceae	8980	*Allocasuarina defungens*		Dwarf Heath Casuarina	E1	E	1	
Plantae	Flora	Casuarinaceae	14655	*Allocasuarina thalassoscopica*				E	1159	
Plantae	Flora	Cunoniaceae	10943	^^*Davidsonia jerseyana*		Davidson's Plum	E1,2	E	36	
Plantae	Flora	Euphorbiaceae	9851	*Chamaesyce psammogeton*		Sand Spurge	E1		1	
Plantae	Flora	Fabaceae (Caesalpinioideae)	1877	*Caesalpinia bonduc*		Knicker Nut	E1		1	
Plantae	Flora	Fabaceae (Faboideae)	15654	*Pedleya acanthoclada*		Thorny Pea	V	V	1	
Plantae	Flora	Fabaceae (Mimosoideae)	7757	*Archidendron hendersonii*		White Lace Flower	V		46	
Plantae	Flora	Flacourtiaceae	3114	*Xylosma terrae-reginae*		Queensland Xylosma	E1		23	
Plantae	Flora	Lauraceae	3477	*Cryptocarya foetida*		Stinking Cryptocarya	V	V	292	
Plantae	Flora	Lauraceae	8948	*Endiandra floydii*		Crystal Creek Walnut	E1	E	44	
Plantae	Flora	Lauraceae	3491	*Endiandra hayesii*		Rusty Rose Walnut	V	V	9	
Plantae	Flora	Lauraceae	8480	*Endiandra muelleri subsp. bracteata*		Green-leaved Rose Walnut	E1		20	
Plantae	Flora	Meliaceae	3682	*Owenia cepiodora*		Onion Cedar	V	V	5	
Plantae	Flora	Menispermaceae	3691	*Tinospora tinosporoides*		Arrow-head Vine	V		15	
Plantae	Flora	Myrtaceae	4283	*Rhodamnia rubescens*		Scrub Turpentine	E4A	CE	26	
Plantae	Flora	Myrtaceae	4284	*Rhodomyrtus psidioides*		Native Guava	E4A	CE	25	
Plantae	Flora	Myrtaceae	4290	*Syzygium hodgkinsoniae*		Red Lilly Pilly	V	V	9	

Plantae	Flora	Myrtaceae	4292	*Syzygium moorei*	Durobby	V	V	39	
Plantae	Flora	Orchidaceae	14732	^^*Diuris byronensis*	Byron Bay Diuris	E1,P,2		61	
Plantae	Flora	Orchidaceae	6672	^^*Geodorum densiflorum*	Pink Nodding Orchid	E1,P,2		124	
Plantae	Flora	Orchidaceae	6990	^^*Oberonia complanata*	Yellow-flowered King of the Fairies	E1,P,2		1	
Plantae	Flora	Orchidaceae	4480	^^*Phaius australis*	Southern Swamp Orchid	E1,P,2	E	9	
Plantae	Flora	Orchidaceae	7324	^^*Pterostylis nigricans*	Dark Greenhood	V,P,2		26	
Plantae	Flora	Polypodiaceae	8156	*Drynaria rigidula*	Basket Fern	E1,3		2	
Plantae	Flora	Proteaceae	5354	*Floydia praealta*	Ball Nut	V	V	3	
Plantae	Flora	Proteaceae	5372	*Grevillea hilliana*	White Yiel Yiel	E1		1	
Plantae	Flora	Proteaceae	9680	*Macadamia integrifolia*	Macadamia Nut		V	6	
Plantae	Flora	Proteaceae	5446	*Macadamia tetraphylla*	Rough-shelled Bush Nut	V	V	17	
Plantae	Flora	Psilotaceae	8164	*Psilotum complanatum*	Flat Fork Fern	E1,3		1	
Plantae	Flora	Rutaceae	6457	*Acronychia littoralis*	Scented Acronychia	E1	E	15	
Plantae	Flora	Rutaceae	8658	*Melicope vitiflora*	Coast Euodia	E1		2	
Plantae	Flora	Sapindaceae	8291	*Lepiderema pulchella*	Fine-leaved Tuckeroo	V		1	

and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Licensed Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Animals in selected area Report generated on 30/05/2025 11:53 AM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Myobatrachidae	3137	*Crinia tinnula*		Wallum Froglet	V,P		140	
Animalia	Amphibia	Hylidae	3166	*Litoria aurea*		Green and Golden Bell Frog	E1,P	V	3	
Animalia	Amphibia	Hylidae	3202	*Litoria olongburensis*		Olongburra Frog	V,P	V	34	
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P	E	121	
Animalia	Reptilia	Cheloniidae	2007	*Chelonia mydas*		Green Turtle	V,P	V	124	
Animalia	Reptilia	Cheloniidae	2008	*Eretmochelys imbricata*		Hawksbill Turtle	P	V	100	
Animalia	Aves	Anseranatidae	0199	*Anseranas semipalmata*		Magpie Goose	V,P		3	
Animalia	Aves	Anatidae	0216	*Oxyura australis*		Blue-billed Duck	V,P		2	
Animalia	Aves	Anatidae	0214	*Stictonetta naevosa*		Freckled Duck	V,P		6	
Animalia	Aves	Phaethontidae	0107	*Phaethon rubricauda*		Red-tailed Tropicbird	V,P	C,J	1	
Animalia	Aves	Columbidae	0025	*Ptilinopus magnificus*		Wompoo Fruit-Dove	V,P		11	
Animalia	Aves	Columbidae	0021	*Ptilinopus regina*		Rose-crowned Fruit-Dove	V,P		23	
Animalia	Aves	Columbidae	0023	*Ptilinopus superbus*		Superb Fruit-Dove	V,P		3	
Animalia	Aves	Podargidae	0314	*Podargus ocellatus*		Marbled Frogmouth	V,P		3	
Animalia	Aves	Apodidae	0334	*Hirundapus caudacutus*		White-throated Needletail	V,P	V,C,J,K	98	
Animalia	Aves	Procellariidae	8684	*Pterodroma leucoptera leucoptera*		Gould's Petrel	V,P	E	1	
Animalia	Aves	Procellariidae	0955	*Pterodroma nigripennis*		Black-winged Petrel	V,P		1	
Animalia	Aves	Ciconiidae	0183	*Ephippiorhynchus asiaticus*		Black-necked Stork	E1,P		78	
Animalia	Aves	Ardeidae	0197	*Botaurus poiciloptilus*		Australasian Bittern	E1,P	E	13	

Animalia	Aves	Ardeidae	0196	*Ixobrychus flavicollis*	Black Bittern	V,P		17
Animalia	Aves	Accipitridae	0226	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	V,P		175
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*	Little Eagle	V,P		7
Animalia	Aves	Accipitridae	0230	*Lophoictinia isura*	Square-tailed Kite	V,P,3		3
Animalia	Aves	Accipitridae	8739	*Pandion cristatus*	Eastern Osprey	V,P,3		206
Animalia	Aves	Gruidae	0177	*Antigone rubicunda*	Brolga	V,P		4
Animalia	Aves	Rallidae	0053	*Amaurornis moluccana*	Pale-vented Bush-hen	V,P		26
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*	Bush Stone-curlew	E1,P		68
Animalia	Aves	Burhinidae	0175	*Esacus magnirostris*	Beach Stone-curlew	E4A,P		45
Animalia	Aves	Haematopodidae	0131	*Haematopus fuliginosus*	Sooty Oystercatcher	V,P		13
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*	Pied Oystercatcher	E1,P		241
Animalia	Aves	Charadriidae	0141	*Charadrius leschenaultii*	Greater Sand-plover	V,P	V,C,J,K	1
Animalia	Aves	Charadriidae	0139	*Charadrius mongolus*	Lesser Sand-plover	V,P	E,C,J,K	21
Animalia	Aves	Jacanidae	0171	*Irediparra gallinacea*	Comb-crested Jacana	V,P		261
Animalia	Aves	Rostratulidae	0170	*Rostratula australis*	Australian Painted Snipe	E1,P	E	2
Animalia	Aves	Scolopacidae	0166	*Calidris alba*	Sanderling	V,P	C,J,K	16
Animalia	Aves	Scolopacidae	0164	*Calidris canutus*	Red Knot	P	E,C,J,K	2
Animalia	Aves	Scolopacidae	0161	*Calidris ferruginea*	Curlew Sandpiper	E4A,P	CE,C,J,K	13
Animalia	Aves	Scolopacidae	0165	*Calidris tenuirostris*	Great Knot	V,P	V,C,J,K	3
Animalia	Aves	Scolopacidae	0168	*Gallinago hardwickii*	Latham's Snipe	V,P	V,J,K	12
Animalia	Aves	Scolopacidae	0152	*Limosa limosa*	Black-tailed Godwit	V,P	E,C,J,K	6
Animalia	Aves	Scolopacidae	0149	*Numenius madagascariensis*	Eastern Curlew	E4A,P	CE,C,J,K	54
Animalia	Aves	Scolopacidae	0158	*Tringa nebularia*	Common Greenshank	E1,P	E,C,J,K	2
Animalia	Aves	Laridae	0982	*Anous albivitta*	Grey Ternlet	V,P		1
Animalia	Aves	Laridae	0972	*Gygis alba*	White Tern	V,P		1

Animalia	Aves	Laridae	0120	*Onychoprion fuscatus*	Sooty Tern	V,P		2
Animalia	Aves	Laridae	0117	*Sternula albifrons*	Little Tern	E1,P	C,J,K	83
Animalia	Aves	Cacatuidae	8862	^^*Calyptorhynchus lathami lathami*	South-eastern Glossy Black-Cockatoo	V,P,2	V	12
Animalia	Aves	Psittacidae	8028	^^*Cyclopsitta diophthalma coxeni*	Coxen's Fig-Parrot	E4A,P,2	CE	1
Animalia	Aves	Psittacidae	0260	*Parvipsitta pusilla*	Little Lorikeet	V,P		4
Animalia	Aves	Strigidae	0246	*Ninox connivens*	Barking Owl	V,P,3		2
Animalia	Aves	Strigidae	0248	*Ninox strenua*	Powerful Owl	V,P,3		2
Animalia	Aves	Tytonidae	0252	*Tyto longimembris*	Eastern Grass Owl	V,P,3		17
Animalia	Aves	Tytonidae	0250	*Tyto novaehollandiae*	Masked Owl	V,P,3		3
Animalia	Aves	Tytonidae	9924	*Tyto tenebricosa*	Sooty Owl	V,P,3		2
Animalia	Aves	Alcedinidae	0327	*Todiramphus chloris*	Collared Kingfisher	V,P		1
Animalia	Aves	Meliphagidae	0610	*Lichenostomus fasciogularis*	Mangrove Honeyeater	V,P		2
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*	Varied Sittella	V,P		3
Animalia	Aves	Monarchidae	0376	*Carterornis leucotis*	White-eared Monarch	V,P		9
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	3
Animalia	Mammalia	Dasyuridae	1045	*Planigale maculata*	Common Planigale	V,P		16
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*	Koala	E1,P	E	870
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*	Squirrel Glider	V,P		2
Animalia	Mammalia	Potoroidae	1767	*Potorous tridactylus tridactylus*	Northern long-nosed potoroo	V,P	V	6
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	90
Animalia	Mammalia	Pteropodidae	1294	*Syconycteris australis*	Common Blossom-bat	V,P		7
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		1
Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*	Southern Myotis	V,P		35
Animalia	Mammalia	Vespertilionidae	1336	*Nyctophilus bifax*	Eastern Long-eared Bat	V,P		34

Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P		5
Animalia	Mammalia	Miniopteridae	1346	*Miniopterus australis*	Little Bent-winged Bat	V,P		39
Animalia	Mammalia	Miniopteridae	3330	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P		10
Animalia	Mammalia	Muridae	1466	*Pseudomys gracilicaudatus*	Eastern Chestnut Mouse	V,P		2
Animalia	Mammalia	Dugongidae	1558	*Dugong dugon*	Dugong	E1,P		3
Animalia	Mammalia	Otariidae	1543	*Arctocephalus forsteri*	New Zealand Fur-seal	V,P		1
Animalia	Mammalia	Otariidae	1882	*Arctocephalus pusillus doriferus*	Australian Fur-seal	V,P		1
Animalia	Insecta	Noctuidae	T1055	*Phyllodes imperialis smithersi*	Southern Pink Underwing Moth	E1	E	8
Animalia	Insecta	Nymphalidae	I024	*Argynnis hyperbius*	Laced Fritillary	E1	CE	1
Animalia	Gastropoda	Camaenidae	I002	*Thersites mitchellae*	Mitchell's Rainforest Snail	E1	CE	246

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 30-May-2025

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	109
Listed Migratory Species:	59

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	3
Commonwealth Heritage Places:	2
Listed Marine Species:	91
Whales and Other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	8
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	9
Key Ecological Features (Marine):	None
Biologically Important Areas:	5
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In buffer area only
Grey box-grey gum wet forest of subtropical eastern Australia	Endangered	Community may occur within area	In buffer area only
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	In buffer area only
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia			
Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area	In feature area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
[Erythrotriorchis radiatus](#) Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
[Falco hypoleucos](#) Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
[Fregetta grallaria grallaria](#) White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Limosa lapponica baueri](#) Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area	In feature area
[Macronectes giganteus](#) Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
[Macronectes halli](#) Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In feature area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding likely to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche impavida](#) Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area
FISH			
[Epinephelus daemelii](#) Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Hippocampus whitei](#) White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In feature area
[Mordacia praecox](#) Non-parasitic Lamprey, Precocious Lamprey [81530]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Seriolella brama](#) Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
FROG			
[Litoria olongburensis](#) Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Mixophyes fleayi](#) Fleay's Frog [25960]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Mixophyes iteratus](#)			
Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
INSECT			
[Argynnis hyperbius inconstans](#)			
Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Phyllodes imperialis smithersi](#)			
Pink Underwing Moth [86084]	Endangered	Species or species habitat known to occur within area	In buffer area only
MAMMAL			
[Balaenoptera borealis](#)			
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Balaenoptera musculus](#)			
Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
[Balaenoptera physalus](#)			
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Chalinolobus dwyeri](#)			
Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat may occur within area	In feature area
[Dasyurus maculatus maculatus (SE mainland population)](#)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
[Eubalaena australis](#)			
Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
[Petaurus australis australis](#)			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus tridactylus			
Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
Sousa sahulensis			
Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area	In feature area
Xeromys myoides			
Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat may occur within area	In feature area
PLANT			
Acronychia littoralis			
Scented Acronychia [8582]	Endangered	Species or species habitat known to occur within area	In feature area
Allocasuarina thalassoscopica			
[21927]	Endangered	Species or species habitat known to occur within area	In feature area
Arthraxon hispidus			
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat known to occur within area	In feature area
Baloghia marmorata			
Marbled Balogia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Bosistoa transversa			
Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bulbophyllum globuliforme Miniature Moss-orchid, Hoop Pine Orchid [6649]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In feature area
Davidsonia jerseyana Davidson's Plum [67219]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Davidsonia johnsonii Smooth Davidsonia, Smooth Davidson's Plum, Small-leaved Davidson's Plum [67178]	Endangered	Species or species habitat likely to occur within area	In feature area
Diploglottis campbellii Small-leaved Tamarind [21484]	Endangered	Species or species habitat likely to occur within area	In feature area
Elaeocarpus williamsianus Hairy Quandong [8956]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Endiandra floydii Floyd's Walnut, Crystal Creek Walnut [52955]	Endangered	Species or species habitat known to occur within area	In feature area
Endiandra hayesii Rusty Rose Walnut, Velvet Laurel [13866]	Vulnerable	Species or species habitat known to occur within area	In feature area
Floydia praealta Ball Nut, Possum Nut, Big Nut, Beefwood [15762]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Fontainea australis Southern Fontainea [24037]	Vulnerable	Species or species habitat may occur within area	In feature area
Gossia fragrantissima Sweet Myrtle, Small-leaved Myrtle [78867]	Endangered	Species or species habitat may occur within area	In buffer area only
Hicksbeachia pinnatifolia Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Leichhardtia longiloba listed as Marsdenia longiloba Clear Milkvine [91911]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area	In feature area
Ochrosia moorei Southern Ochrosia [11350]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Owenia cepiodora Onionwood, Bog Onion, Onion Cedar [11344]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat known to occur within area	In feature area
Randia moorei Spiny Gardenia [10577]	Endangered	Species or species habitat known to occur within area	In feature area
Rhodamnia maideniana Smooth Scrub Turpentine [20665]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Symplocos baeuerlenii Small-leaved Hazelwood, Shrubby Hazelwood [19010]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Syzygium hodgkinsoniae Smooth-bark Rose Apple, Red Lilly Pilly [3539]	Vulnerable	Species or species habitat known to occur within area	In feature area
Syzygium moorei Rose Apple, Coolamon, Robby, Durobby, Watermelon Tree, Coolamon Rose Apple [12284]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
Vincetoxicum woollsii listed as Tylophora woollsii [40080]	Endangered	Species or species habitat may occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Congregation or aggregation known to occur within area	In feature area
Eretmochelys imbricata			
Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lepidochelys olivacea			
Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
SHARK			
Carcharias taurus (east coast population)			
Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area	In feature area
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Galeorhinus galeus			
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Sphyrna lewini			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
SNAIL			
Thersites mitchellae			
Mitchell's Rainforest Snail [66774]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Anous stolidus](#) Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
[Ardenna carneipes](#) Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area	In feature area
[Ardenna grisea](#) Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Ardenna pacifica](#) Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
[Calonectris leucomelas](#) Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
[Diomedea antipodensis](#) Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
[Diomedea epomophora](#) Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
[Diomedea exulans](#) Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
[Fregata ariel](#) Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
[Fregata minor](#) Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding likely to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area

Migratory Marine Species

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area
Carcharias taurus Grey Nurse Shark [64469]		Congregation or aggregation known to occur within area	In feature area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Congregation or aggregation known to occur within area	In feature area
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Eretmochelys imbricata](#) Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Eubalaena australis as Balaena glacialis australis](#) Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
[Lamna nasus](#) Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
[Lepidochelys olivacea](#) Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
[Megaptera novaeangliae](#) Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
[Mobula alfredi as Manta alfredi](#) Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In feature area
[Mobula birostris as Manta birostris](#) Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
[Rhincodon typus](#) Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
[Sousa sahulensis as Sousa chinensis](#) Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area	In feature area

Migratory Terrestrial Species

Scientific Name	Threatened Category	Presence Text	Buffer Status
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Breeding known to occur within area	In feature area
Thalasseus bergii			
Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [11303]	NSW	In feature area
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11302]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Commission [11299]	NSW	In buffer area only

Commonwealth Heritage Places [Resource Information]

Name	State	Status	Buffer Status
Historic			
Byron Bay Post Office	NSW	Listed place	In feature area
Cape Byron Lighthouse	NSW	Listed place	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
[Macronectes giganteus](#) Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
[Macronectes halli](#) Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Pachyptila turtur](#) Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
[Pandion haliaetus](#) Osprey [952]		Breeding known to occur within area	In feature area
[Phaethon lepturus](#) White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In feature area
[Phoebetria fusca](#) Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
[Pterodroma cervicalis](#) White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
[Rostratula australis as Rostratula benghalensis (sensu lato)](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Stercorarius antarcticus as Catharacta skua](#) Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
[Sterna striata](#) White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
[Sternula albifrons as Sterna albifrons](#) Little Tern [82849]	Vulnerable	Breeding likely to occur within area	In feature area
[Symposiachrus trivirgatus as Monarcha trivirgatus](#) Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche carteri](#) Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche cauta](#) Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
[Thalassarche impavida](#) Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalasseus bergii as Sterna bergii](#) Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Fish			
[Acentronura tentaculata](#) Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In feature area
[Campichthys tryoni](#) Tryon's Pipefish [66193]		Species or species habitat may occur within area	In feature area
[Corythoichthys amplexus](#) Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area	In feature area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area	In feature area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In feature area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In feature area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area	In feature area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area	In feature area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In feature area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area	In feature area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In feature area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In feature area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area	In feature area
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area	In feature area
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area	In feature area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area	In feature area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area	In feature area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In feature area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In feature area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Stigmatopora nigra](#) Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
[Syngnathoides biaculeatus](#) Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In feature area
[Trachyrhamphus bicoarctatus](#) Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In feature area
[Urocampus carinirostris](#) Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
[Vanacampus margaritifer](#) Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
Mammal			
[Dugong dugon](#) Dugong [28]		Species or species habitat may occur within area	In feature area
Reptile			
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Congregation or aggregation known to occur within area	In feature area
[Eretmochelys imbricata](#) Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Hydrophis elegans](#) Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hydrophis platura as Pelamis platurus Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area	In feature area
Hydrophis stokesii as Astrotia stokesii Stokes' Sea Snake [93510]		Species or species habitat may occur within area	In feature area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Sousa sahulensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area	In feature area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In feature area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Arakwal	National Park	NSW	In buffer area only
Cape Byron	State Conservation Area	NSW	In buffer area only
Cape Byron	Marine Park	NSW	In feature area
Cumbebin Swamp	Nature Reserve	NSW	In buffer area only
Hayters Hill	Nature Reserve	NSW	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Julian Rocks Nguthungulli	Nature Reserve	NSW	In buffer area only
Ti-Tree Lake	Aboriginal Area	NSW	In buffer area only
Tyagarah	Nature Reserve	NSW	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Sandhills Stormwater Management Systems Project	2024/09784		Completed	In feature area
Controlled action				
Harvest Estate, West Byron Urban Release Area, Ewingsdale Road, Byron Bay, NSW	2018/8166	Controlled Action	Post-Approval	In buffer area only
Installation of three swing moorings in Byron Bay	2002/717	Controlled Action	Completed	In buffer area only
Not controlled action				
Byron Shire Council Sewage Treatment Plant Upgrade	2000/48	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Residential dwelling, 26 Shelley Drive	2004/1362	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Byron Bay Town Centre Bypass	2019/8562	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Byron Shire Bioenergy Facility	2021/8969	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed	In feature area

Biologically Important Areas			[Resource Information]
Scientific Name	Behaviour	Presence	Buffer Status
Dolphins			
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur	In buffer area only
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Known to occur	In feature area
Marine Turtles			
Caretta caretta Loggerhead Turtle [1763]	Nesting	Known to occur	In feature area
Sharks			
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur	In feature area
Whales			
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	Known to occur	In feature area

Bioregional Assessments			[Resource Information]
SubRegion	BioRegion	Website	Buffer Status
Clarence-Moreton	Clarence-Moreton	BA website	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Appendix B - Photographs

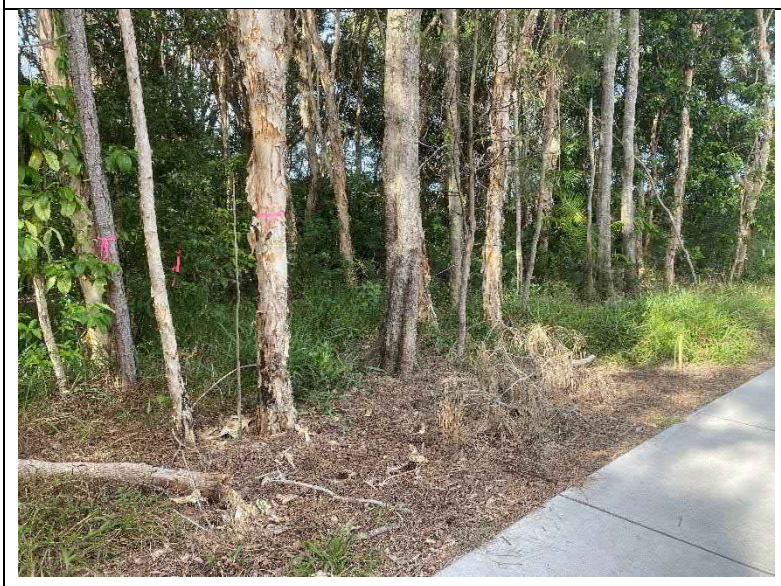
	Photo 1. View of footpath to south; trenching will occur ~1.5 off the eastern side as shown in red (approx.)
	Photo 2. View of footpath to north; trenching to occur in grassy shoulder as shown in red (approx.)
	*Photo 3. Typical trees to be removed from vegetation edge at southern end of trenching (PCT 4004 Northern Melaleuca quinquenervia Swamp Forest)*

	Photo 4. Swamp Oak within a small patch of PCT 4034 to be removed from small patch at northern end of works
	Photo 5. Mature (planted) Weeping Lilly Pilly at Sandhills daycare centre – to be pruned.
	Photo 6. Planted Blue Lilly Pilly (x2) on western road verge – to be pruned.

Appendix C – Test of Significance (BC Act)

The threatened species test of significance (ToS) is used to determine if a development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. The ToS is applied as part of the Biodiversity Offsets Scheme (BOS) entry requirements and is set out in s.7.3 of the *Biodiversity Conservation Act 2016*.

A ToS has been completed for the following threatened entities with regard to the works:

Threatened Ecological Communities:

- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions ('Swamp Oak Floodplain Forest'); as per PCT 4034
- Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions; as per PCT 4004

Threatened flora:

- Stinking Laurel.

NOTE: No assessment of other entities has been completed as threatened fauna have been adequately assessed in the biodiversity assessment for Stage 1 by Planit Consulting, and the additional incremental loss of habitat for Stage 2 of the project is relatively low in the context of the site and the existing landscape.

Test of significance for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Stinking Laurel: No trees will require removal (a single tree may require partial pruning to accommodate light pole #7) and the remaining 16 trees retained in the immediate area are likely to provide a sufficient basis for the sustaining of the local population of the species. It would be expected that ongoing recruitment of new individuals of the species would occur via dispersal from the larger proximate and well established population of the species within the nearby Cape Byron State Conservation Area. As noted, 43 Stinking Laurel trees were recorded in the eastern portion of Sandhills Estate (refer Planit. 2023).

On this basis it is considered unlikely that the proposal would contribute to placing the local population of Stinking Laurel at increased risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Swamp Oak Floodplain Forest (SOFF)

The proposed works result in the removal of several trees located in a small fragmented patch of Swamp Oak Floodplain Forest in the north of the site. This loss is unlikely to affect the extent or composition of this community to the extent that it is likely to be placed at risk of extinction as:

- Impacts to ~ 20 m² of highly degraded Swamp Oak Floodplain Forest ('SOFF') is relatively low in the context of areas of SOFF retained adjacent (to the west) of the site (refer **Figure 2**).
- Retained areas of SOFF within the site would not be adversely modified or ecologically compromised.

Swamp Sclerophyll Forest (SSF)

The proposed works result in the removal of three Broad-leaved Paperbark on the outer edge of PCT 4004. This loss is unlikely to affect the extent or composition of this community to the extent that it is likely to be placed at risk of extinction as:

- Impacts to three individual trees is negligible in the context of areas of SSF retained adjacent (to the east) of the site (refer **Figure 2**).
- Retained areas of SSF within the site would not be adversely modified or ecologically compromised.

(c) In relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

Stinking Laurel: no habitat will be removed; a single tree may require partial pruning to accommodate light pole #7.

Swamp Oak Floodplain Forest (SOFF): Degraded SOFF is in poor condition and represents a (low quality) negligible portion of this community in the eastern part of Sandhills Estate.

Swamp Sclerophyll Forest (SSF): habitat removal is limited to three individual trees representing a negligible contraction of SSF at the site.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

Stinking Laurel: no habitat fragmentation would occur.

Swamp Oak Floodplain Forest (SOFF): the site is already fragmented/disturbed from previous historic works and informal access pathways. The proposal will not result in any further significant fragmentation of this community.

Swamp Sclerophyll Forest (SSF): No further fragmentation of SSF would occur.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

Stinking Laurel: The habitat to be removed is atypical for the species and is of relatively low importance at a local scale, when better quality habitat occurs (eg. in the east of Sandhills Estate). The loss of habitat for the project is unlikely to be of significant important for the long term survival of Stinking Laurel in the locality. The pruning of a single tree will not affect habitat for the species.

Swamp Oak Floodplain Forest (SOFF): SOFF at the site is highly degraded and dominated by woody weeds and has no opportunity to expand further given spatial constraints – this habitat is not important in a local context.

Swamp Sclerophyll Forest (SSF): SSF at the site is highly degraded with woody weeds commonly occurring and has no opportunity to expand further given spatial and hydrological constraints – this habitat is not important in a local context.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

There are no declared areas of outstanding biodiversity value within Byron LGA.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to increase the impact of a key threatening process.

A key threatening process is listed in the *Biodiversity Conservation Act 2016* if it:

- adversely affects threatened species or ecological communities
- could cause species or ecological communities to become threatened.

The current list of key threatening processes (KTPs) and whether the proposal constitutes any KTPs, is summarised in **Table C.1**.

Table C.1 *Key Threatening Process assessment*

Key Threatening Processes (as per Schedule 4 of the BC Act)	***Does the development or activity contribute towards a key threatening process?***		
	Likely	***Possibly***	***Unlikely***
Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*)			✓
Alteration of habitat following subsidence due to longwall mining			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Anthropogenic climate change			✓
Bush rock removal			✓
Clearing of native vegetation	✓		
Competition and grazing by the feral European rabbit (*Oryctolagus cuniculus*)			✓
Competition and habitat degradation by feral goats (*Capra hircus*)			✓
Competition from feral honey bees (*Apis mellifera*)			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Forest Eucalypt dieback associated with over-abundant psyllids and bell miners			✓
Habitat degradation and loss by Feral Horses			✓
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition			✓
Herbivory and environmental degradation caused by feral deer			✓
Importation of red imported fire ants (*Solenopsis invicta*)			✓
Infection by psittacine circoviral (beak and feather) disease affecting endangered psittacine species and populations			✓

Key Threatening Processes (as per Schedule 4 of the BC Act)	***Does the development or activity contribute towards a key threatening process?***		
	Likely	***Possibly***	***Unlikely***
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae			✓
Introduction of the large earth bumblebee (*Bombus terrestris*)			✓
Invasion and establishment of exotic vines and scramblers			✓
Invasion and establishment of Scotch broom (*Cytisus scoparius*)			✓
Invasion and establishment of the cane toad (*Bufo marinus*)			✓
Invasion of native plant communities by African Olive *Olea europaea L. subsp. cuspidata*			✓
Invasion, establishment and spread of *Lantana camara*			✓
Invasion of native plant communities by *Chrysanthemoides monilifera* (bitou bush and boneseed)			✓
Invasion of native plant communities by exotic perennial grasses			✓
Invasion of the yellow crazy ant (*Anoplolepis gracilipes* (Fr. Smith) into NSW			✓
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants			✓
Loss of hollow-bearing trees			✓
Loss or degradation (or both) of sites used for hill-topping by butterflies			✓
Predation and hybridisation of feral dogs (*Canis lupus familiaris*)			✓
Predation by the European red fox (*Vulpes vulpes*)			✓
Predation by the feral cat (*Felis catus*)			✓
Predation by *Gambusia holbrooki* (plague minnow or mosquito fish)			✓
Predation by the ship rat (*Rattus rattus*) on Lord Howe Island			✓
Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)			✓
Removal of dead wood and dead trees			✓

The proposal is characteristic of the following KTPs:

- *Clearing of native vegetation*: As noted, a small number of native trees may be removed for the works. This habitat loss will not be significant to any of the subject entities.

Conclusion:

The proposal is unlikely to result in a significant impact on the any of the entities assessed. Consequently, further consideration in the form of a BDAR is not required.

Appendix C – Environmental Searches

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : J7572C

Client Service ID : 797811

Sean Cochran

Date: 05 July 2023

17A Beech Drive
Suffolk Park New South Wales 2481

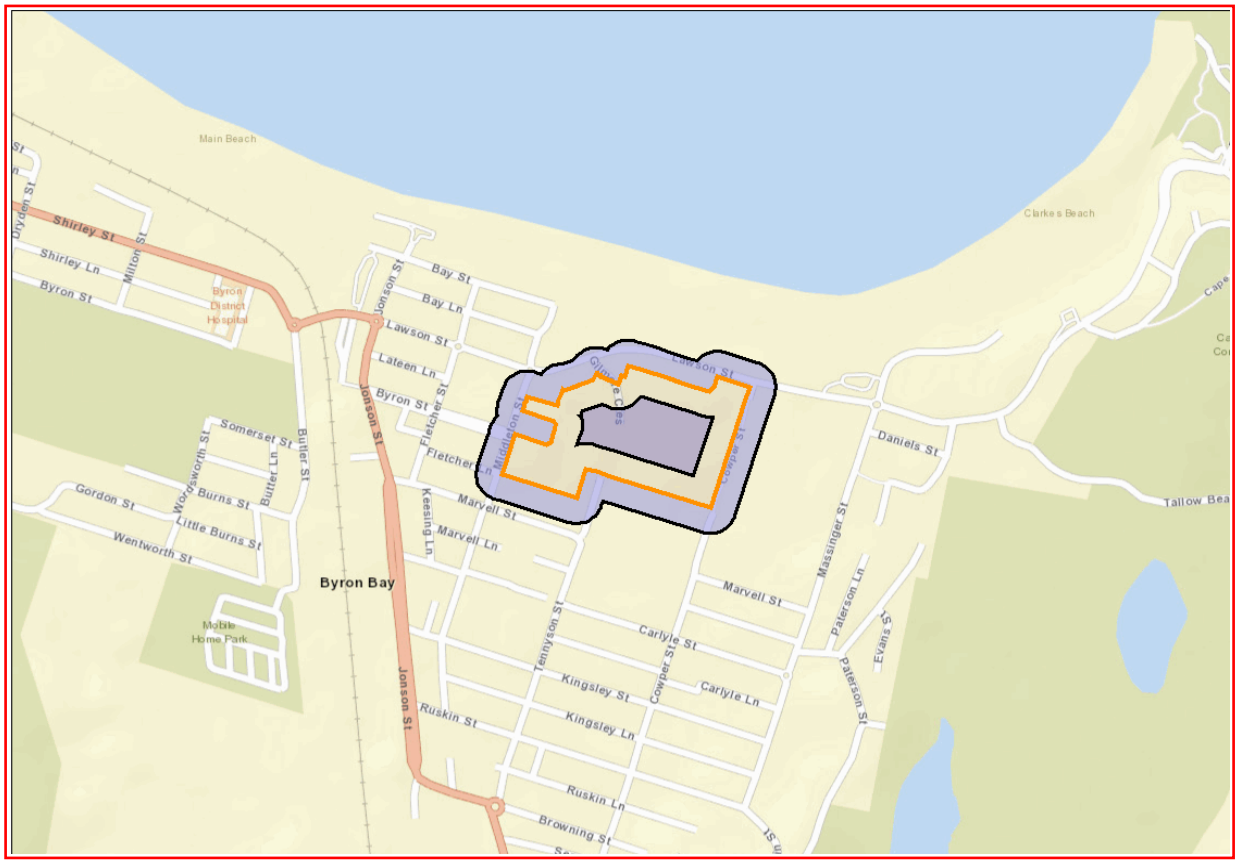
Attention: Sean Cochran

Email: sean@planitconsulting.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 457, DP:DP1087879, Section : - with a Buffer of 50 meters, conducted by Sean Cochran on 05 July 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

Search Results

39 results found.

Allansby Area		Eureka, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Andrew Johnston Memorial Scrub and Adjacent Areas	Beacoms Rd	Eureka, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Bennys Creek Scrub	Beacoms Rd	Clunes, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Blackbutt Plateau		Mullumbimby, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Booyong Scrub	Booyong Rd	Nashua, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Broken Head Marine Reserve Proposal		Broken Head, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Broken Head Nature Reserve (1977 boundary)		Broken Head, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Broken Head and Adjacent Areas		Broken Head, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Brunswick Heads Nature Reserve (1979 boundary)		Brunswick Heads, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Byron Bay Post Office	61 Jonson St	Byron Bay, NSW, Australia	(Listed place) Commonwealth Heritage List
Cape Byron Lighthouse	Lighthouse Rd	Byron Bay, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Cape Byron Lighthouse	Lighthouse Rd	Byron Bay, NSW, Australia	(Listed place) Commonwealth Heritage List
Cape Byron Lighthouse and Residences	Lighthouse Rd	Byron Bay, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Cod Hole - Julian Rocks Grey Nurse Shark Habitat		Byron Bay, NSW, Australia	(Place rejected for Emergency Listing) National Heritage List

Courthouse Including Police Station and Lockup 61 Dalley St	Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Emerys Scrub Nashua Rd	Fernleigh, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Farmhouse including Fence and Garden Main Arm Rd	Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Gondwana Rainforests of Australia	Lismore, NSW, Australia	(Declared property) World Heritage List
Gondwana Rainforests of Australia	Lismore, NSW, Australia	(Listed place) National Heritage List
Hayters Hill Scrub Bangalow Rd	Byron Bay, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Indigenous Place	Bangalow, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Indigenous Place	Billinudgel, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Indigenous Place	Broken Head, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Indigenous Place	Byron Bay, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Inverary including Front Fence Main Arm Rd	Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Julian Rocks Aquatic Reserve	Byron Bay, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Julian Rocks Nature Reserve	Byron Bay, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Midgen Flat Scrub	Bangalow, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Minyon Falls Scrub Minyon Dr	Goonengerry, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)

Mortons Scrub Beacoms Rd	Eureka, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Mullumbimby Post Office (original) Myocum St	Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Mullumbimby Power Station Wilsons Creek Rd	Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Myocum Downs Ornithological Area Coolamon Scenic Rd	Mullumbimby, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Nightcap National Park Crofton Rd	Nimbin, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
North Ocean Shores - Natural Area Jones Rd	Billinudgel, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Snows Gully Scrub Upper Coopers Creek Rd	Goonengerry, NSW, Australia	(Interim List) Register of the National Estate (Non-statutory archive)
Wilsons River Scrub Sheaffes Rd	Goonengerry, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Wilsons and Coopers Creek	Lismore, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Yelgun - Wooyung National Heritage Place New Brighton Rd	South Golden Beach, NSW, Australia	(Nomination now ineligible for PPAL) National Heritage List

Report Produced: Wed Jul 5 16:21:46 2023

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Search results

Your search for:Suburb: BYRON BAY

Matched 5 notices relating to 2 sites.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
BYRON BAY	Butler STREET	Butler Street Reserve Byron Bay	4 former
BYRON BAY	Corner Beachcomber Drive and Cooper STREET	Dip 4207 Byron Bay	1 current

Page 1 of 1

5 July 2023

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 05-Jul-2023

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	86
Listed Migratory Species:	58

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	2
Commonwealth Heritage Places:	1
Listed Marine Species:	87
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	1
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	5
Key Ecological Features (Marine):	None
Biologically Important Areas:	4
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat likely to occur within area
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris canutus		
Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
FISH		
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area
FROG		
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat known to occur within area
Mixophyes fleayi Fleay's Frog [25960]	Endangered	Species or species habitat may occur within area
INSECT		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
MAMMAL		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Potorous tridactylus tridactylus Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat likely to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat may occur within area
PLANT		
Acronychia littoralis Scented Acronychia [8582]	Endangered	Species or species habitat known to occur within area
Allocasuarina thalassoscopica [21927]	Endangered	Species or species habitat known to occur within area
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat may occur within area
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat known to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Davidsonia johnsonii Smooth Davidsonia, Smooth Davidson's Plum, Small-leaved Davidson's Plum [67178]	Endangered	Species or species habitat likely to occur within area
Diploglottis campbellii Small-leaved Tamarind [21484]	Endangered	Species or species habitat may occur within area
Endiandra floydii Floyd's Walnut, Crystal Creek Walnut [52955]	Endangered	Species or species habitat likely to occur within area
Endiandra hayesii Rusty Rose Walnut, Velvet Laurel [13866]	Vulnerable	Species or species habitat likely to occur within area
Fontainea australis Southern Fontainea [24037]	Vulnerable	Species or species habitat may occur within area
Leichhardtia longiloba listed as Marsdenia longiloba Clear Milkvine [91911]	Vulnerable	Species or species habitat may occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat known to occur within area
Randia moorei Spiny Gardenia [10577]	Endangered	Species or species habitat likely to occur within area
Rhodamnia maideniana Smooth Scrub Turpentine [20665]	Critically Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat likely to occur within area
Syzygium hodgkinsoniae Smooth-bark Rose Apple, Red Lilly Pilly [3539]	Vulnerable	Species or species habitat likely to occur within area
Syzygium moorei Rose Apple, Coolamon, Robby, Durobby, Watermelon Tree, Coolamon Rose Apple [12284]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Vincetoxicum woollsii listed as Tylophora woollsii [40080]	Endangered	Species or species habitat may occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding likely to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
SHARK		

Scientific Name	Threatened Category	Presence Text
Carcharias taurus (east coast population)		
Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat known to occur within area
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sphyrna lewini		
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area
SNAIL		
Thersites mitchellae		
Mitchell's Rainforest Snail [66774]	Critically Endangered	Species or species habitat known to occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea		
Sooty Shearwater [82651]		Species or species habitat likely to occur within area
Calonectris leucomelas		
Streaked Shearwater [1077]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area

Scientific Name	Threatened Category	Presence Text
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]		Species or species habitat known to occur within area
Migratory Terrestrial Species		

Scientific Name	Threatened Category	Presence Text
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
Charadrius leschenaultii		
Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Limosa lapponica		
Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pandion haliaetus		
Osprey [952]		Breeding known to occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Communications, Information Technology and the Arts - Australian Postal Corporation	
Commonwealth Land - Australian Postal Commission [11303]	NSW
Communications, Information Technology and the Arts - Telstra Corporation Limited	
Commonwealth Land - Australian Telecommunications Commission [11302]	NSW

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Historic		
Byron Bay Post Office	NSW	Listed place

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat likely to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Sterna striata White-fronted Tern [799]		Migration route may occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area
Fish		
Acentronura tentaculata		
Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Campichthys tryoni		
Tryon's Pipefish [66193]		Species or species habitat may occur within area
Corythoichthys amplexus		
Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area
Corythoichthys ocellatus		
Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area
Festucalex cinctus		
Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris		
Tiger Pipefish [66217]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Mammal		
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Reptile		
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding likely to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area
Whales and Other Cetaceans		[Resource Information]

Current Scientific Name	Status	Type of Presence
Mammal		
[Balaenoptera acutorostrata](#) Minke Whale [33]		Species or species habitat may occur within area
[Balaenoptera edeni](#) Bryde's Whale [35]		Species or species habitat may occur within area
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Species or species habitat may occur within area
[Delphinus delphis](#) Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
[Grampus griseus](#) Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
[Megaptera novaeangliae](#) Humpback Whale [38]		Species or species habitat known to occur within area
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat may occur within area
[Sousa sahulensis](#) Australian Humpback Dolphin [87942]		Species or species habitat known to occur within area
[Stenella attenuata](#) Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
[Tursiops aduncus](#) Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State
Cape Byron	Marine Park	NSW

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
North East NSW RFA	New South Wales

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Byron Shire Council Sewage Treatment Plant Upgrade	2000/48	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
Residential dwelling, 26 Shelley Drive	2004/1362	Not Controlled Action	Completed
Not controlled action (particular manner)			
Byron Bay Town Centre Bypass	2019/8562	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed

Biologically Important Areas

Scientific Name	Behaviour	Presence
Dolphins		

Scientific Name	Behaviour	Presence
Tursiops aduncus		
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Known to occur
Marine Turtles		
Caretta caretta		
Loggerhead Turtle [1763]	Nesting	Known to occur
Sharks		
Carcharias taurus		
Grey Nurse Shark [64469]	Foraging	Known to occur
Whales		
Megaptera novaeangliae		
Humpback Whale [38]	Foraging	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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ty TYAGARAH

Landscape—sediment basins of mixed estuarine and aeolian origin forming level to gently undulating plains. Relief is <3 m, elevation <5 m and slopes <1%. Extensively cleared open- and closed-forest.

Landscape Variant—tya—wet areas that have not been drained.

Landscape Variant—tyb—sand deposits of uncertain origin.

Soils—deep (>150 cm), moderately well-drained minimal Prairie Soils (Gn3.91, Gn2.81, Dd4.51) near basaltic areas. Deep (>150 cm), well-drained Podzols (Uc2.33, Uc2) and Acid Peats (O) near barrier systems. Deep (>200 cm), well-drained Podzols and Siliceous Sands (Uc2) in landscape variant **tyb** and deep (>200 cm), poorly drained Peaty Podzols (Uc2) near Tuckean **(tu)** soil landscape.

Limitations—very strongly acid, permeable, often waterlogged soils of low fertility and low water-holding capacity with localised salinity. Permanently high watertables and moderate wind erosion hazard.

LOCATION

Sediment basins of mixed estuarine and aeolian origin within the inland margins of the Tweed-Byron Coast. Examples occur near Tyagarah, west of Brunswick Heads, west of Byron Bay and near Newrybar Swamp. Type location is the plain immediately surrounding Tyagarah airfield (Area reference 5 **53*****E, 68 **36**5**N).

LANDSCAPE

Geology

Quaternary estuarine alluvium overlain by and/or mixed with Quaternary (Pleistocene) sands. The sands are generally aeolian, originating from the adjacent beach ridge systems.

Topography

Level to gently undulating plains. Watertables are generally within 100–200 cm of the surface but can be higher in poorly drained areas. These are essentially the back barrier environment (Thom 1984), a flat-lying sediment basin located inland of the inner barrier system. Within the back barrier zone sediments have accumulated from a number of processes, as listed below (summarised from Thom 1984):

- deposition by suspension from rivers
- washover sand deposition as extensive sheets which have been transported by storm surges across the shore zone and frontal dune ridges
- aeolian reworking of exposed sand surfaces to produce back dune flats.
- channel-fill deposition of flood-tidal delta origin.

Slopes are 0–1%, relief is 1–2 m and elevation is 2–5 m. Streams are generally incipient and poorly defined. An extensive network of drains has modified the natural drainage pattern. Tidal effects can impede drainage, particularly in the Newrybar area. Sub-surface flow drainage is also common.

Vegetation

Extensively cleared tall open- and closed-forest (swamp community).

Broad-leaved paperbark (*Melaleuca quinquenervia*), swamp oak (*Casuarina glauca*) and swamp mahogany (*Eucalyptus robusta*) are common within poorly drained areas.

Where well-drained sands are dominant, red bloodwood (*Eucalyptus gummifera*), pink bloodwood (*Eucalyptus intermedia*), coast banksia (*Banksia integrifolia* var. *integrifolia*) and sand cypress (*Callitris columellaris*) are common.

Forest red gum (*Eucalyptus tereticornis*) and rough-barked apple (*Angophora floribunda*) occur as isolated trees and cleared areas.

Couch (*Cynodon dactylon*) is a common ground cover in cleared areas.

Land Use

Generally left to beef and dairy cattle grazing. Sugar cane is grown at Newrybar. Tea-tree plantations are becoming an important crop on this soil landscape. The main species grown is *Melaleuca alternifolia*. There is a turf farm at Tyagarah. Urban areas include Brunswick Heads and parts of Byron Bay and Ballina. Sandmining was carried out at Newrybar.

Existing Land Degradation

There is minor apparent land degradation within this soil landscape.

Landscape Variants

The areas shown as **tya** on the map are low-lying wetter areas that have not been drained.

Landscape variant **tyb** consists of sand deposits which may be remnants of a barrier mentioned by Roy *et al*. (1981) pre-dating the Pleistocene inner barrier. Although the origin of this variant is uncertain, it is considered as aeolian. It is too small to be shown on the map.

SOILS

Dominant Soil Materials

ty1—Dark coarse sand (topsoil and/or sedimentary layers—A, B and D horizons)

Colour	black (7.5YR 1.7/1, 10R 2/1), bluish black (5PB 1.7/1) to brown (5YR 4/6). Distinct orange and brown mottles (10–50%) are occasionally present
Texture	coarse- to medium-grained sand to clayey sand
Structure	single-grained
Fabric	sandy
Exposed condition	loose, often water repellent as topsoil
Permeability	rapid
pH	4.5–5.0 , occasionally 7.0–7.5
Coarse fragments	few (10–20%) strongly weathered ferromanganese nodules, 6–60 mm may be present, generally when **ty1** occurs at depth
Roots	common when surface material, <2 mm
Pan	soft coffee rock may occur below 150 cm near the Black Rock soil landscape boundary
Type location	cutting 400 m north of Main Northern Canal (Grid Ref. 5 **356****E, 67 **977****N). Soil Data System card 315, 0–20 cm

ty2—Black sandy clay loam (topsoil and deep topsoil—A horizon)

Colour	reddish black (10R 2/1), brownish black (10YR 2/3) to black (7.5YR 1.7/1, 10YR 2/1). Distinct orange mottles (10–20%) occasionally present in deep topsoil
Textured	clay loam, sandy to clay loam and sandy clay loam
Structure	strong when a topsoil, but massive when deep topsoil. Peds are polyhedral 5–20 mm parting to 2–5 mm
Fabric	smooth-faced peds or earthy
Exposed condition	moderately weak, crumbly when dry
Permeability	moderate to rapid, depending on structure
pH	4.0–5.0
Coarse **fragments**	none
Roots	common, 1–5 mm
Pan	weak, discontinuous, platy organic pan, 2–10 cm deep, may be present
Type location	cutting 400 m north of Main Northern Canal (Grid Ref. 5 **356****E, 67 **977****N). Soil Data System card 315, 20–40 cm

ty3—Brown mottled sandy clay (subsoil—B horizon)

Colour	black (5Y 2/1), brownish black (10YR 3/1) to greyish yellow brown (10YR 5/2). Distinct brown and yellow mottles common (2–20%)
Texture	light to heavy sandy clay
Structure	weak, polyhedral/sub-angular blocky, 20–50 mm, parting to 5–20 mm
Fabric	smooth-faced
Exposed Condition	hardsetting, moderately weak, crumbly when dry
Permeability	rapid
pH	4.5–5.5
Coarse fragments	none
Roots	few to common, 2–5 mm
Type location	drain on Riverside Drive, Brunswick Heads (Grid Ref. 5 **523****E, 68 **434****N). Soil Data System card 374, 20–50 cm

Associated Soil Materials

Soil materials of Black Rock **(br)** soil landscape occur within the level sand sheet areas and landscape variant **tya**, forming Podzols.

br1—Black loamy sand
br2—Bleached sand
br3—Black organic peat

Occurrences and relationships are similar to those of Black Rock **(br)** soil landscape.

Soil materials of the Dungarubba **(du)** soil landscape overlie Podzols in many sites within landscape variant **tyb**.

du1—Black peaty loam

Strongly cemented brown organic pan (coffee rock). Sand grains cemented by organic matter. Generally it occurs from 50–150 cm.

Light grey fine-grained sand. Occurs as thin layers (10–20 cm) at varying depths.

Shelly, calcareous sand. Possibly associated with old estuarine areas. This material ranges in colour from brownish grey (10YR 4/1) to greyish olive (5Y 4/2). There are many (20–50%) shells and shell fragments, particularly at depth.

Acid sulphate material. Has been identified by Willett (1989) near the vicinity of the original course of Deadmans Creek. The acid sulphate material is generally a dark grey clay with yellow jarositic streaks and mottles. Potential and actual acid sulphate material may be expected in the vicinity of old tidal streams, but their occurrence within this soil landscape is generally not widespread.

Occurrence and Relationships

Soil relationships within Tyagarah soil landscape are varied and diverse due to the complex origin of this landform.

A more detailed soil survey at a larger scale would be required to map the soils. The following relationships have been observed. Further information from the Newrybar area can be found in Veness (1989) and Willett (1989).

Plain (generally near basaltic areas). Up to 40 cm of black sandy clay loam **(ty2)** overlies varying depths (generally up to 40 cm) of brown mottled sandy clay **(ty3).** Boundaries are gradual to clear. **ty3** overlies varying thicknesses of dark coarse sand **(ty1)** and light grey fine-grained sand. Further inclusions of **ty3** occur throughout the subsoil. Boundaries are gradual to sharp and the stratigraphic order of soil materials is variable. Often **ty1** may form a thin (5–10 cm) surface layer [moderately well-drained minimal Prairie Soils (Gn3.91, Gn2.81, Dd4.51, Dd2.51)]. Total depth is >150 cm.

Plain (generally areas inland of inner barrier). Up to 30 cm **ty1** or black loamy sand **(br1)** overlies up to and >200 cm of bleached sand **(br2). br2** overlies a brown organic pan (coffee rock). Boundaries are wavy [well-drained Podzols (Uc2.33, Uc2.2)]. Depth to the pan can vary from 50–>150 cm. Black organic peat **(br3)** may occur as a surface layer in depressions and near swampy areas (i.e., **tya** variant) or as discrete layers within sands. Depth can vary from 15–>100 cm [Acid Peats (O)]. **br3** may clearly overlie **br1**, **ty1**, or **br2** when it occurs as a surface material.

Landscape variant tyb. Up to 50 cm **ty2** overlies 100–200 cm **ty1**. **ty1** in turn overlies >100 cm **br2.** Boundaries are clear [well-drained Podzols and Siliceous Sands (Uc2)]. Total soil depth is >200 cm.

Landscape variant tyb—near Tuckean (tu) soil landscape and low-lying areas. Up to 50 cm of black peaty loam **(du1)** clearly overlies 50 cm **ty2** which in turn overlies 100–200 cm **ty1. ty1** overlies >100 cm **br2.** Boundaries are clear to gradual [poorly drained Peaty Podzols (peat material overlying Uc2)]. Total soil depth is >200 cm.

LIMITATIONS TO DEVELOPMENT

Soil Limitations

ty1 Very strongly acid
High aluminium toxicity potential
Very low available water-holding capacity
High wind erodibility
High permeability
Low fertility

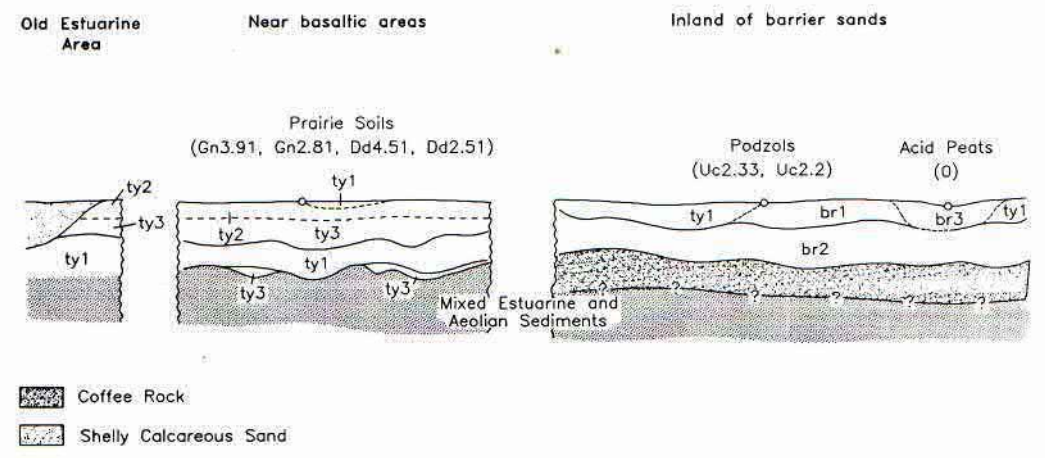
ty2 Very strongly acid
Sodic
Very high aluminium toxicity potential
High permeability
Very low available water-holding capacity
Low fertility
Moderate wind erodibility

ty3 Very strongly acid
Strongly sodic (localised)
Salinity (localised)
High permeability
Low available water-holding capacity
Low fertility

Fertility

Soil Materials as Growth Media. Generally low for all soil materials. Topsoil **ty1** has high organic matter content but is very strongly acid, has low CEC and very low water-holding capacity. **ty2** has very low CEC and very low water-holding capacity. Subsoil **ty3** has moderate CEC but can be very sodic and saline. **ty1** and **ty2** have high aluminium toxicity potential. Phosphorus levels are generally low.

Soil Profile Fertility. Soil profile suitability as a growth medium is low to moderate for poorly to moderately well-drained minimal Prairie Soils. Profile suitability is low for Podzols, Siliceous Sands, Peaty Podzols and Acid Peats. Soil volumes available for root penetration are generally high, though watertables are also high.



■ *Schematic cross-section of Tyagarah soil landscape illustrating the occurrence and relationship of the dominant soil materials.*

Erodibility

	K factor	Non-concentrated flows	Concentrated flows	Wind
ty1	0.000	very low	low	moderate
ty2	0.020	low-mod	moderate	moderate
ty3	0.020	low-mod	moderate	low-mod

Erosion Hazard

	Non-concentrated flows	Concentrated flows	Wind
grazing	slight	slight	moderate
cultivation	slight	sl-mod	moderate
urban	slight	sl-mod	moderate

Foundation Hazard

Moderate to high foundation hazard due to high watertables and the possible presence of peaty materials with low bearing strengths and waterlogged soils. Topsoil depth is 20–30 cm. Total soil depth is >150 cm.

Landscape Limitations

Waterlogging
Permanently high watertables
Moderate wind erosion hazard
Acid sulphate soils and possible potential acid sulphate soils (very localised and probably of minor extent, generally along old estuarine areas)

Urban Capability

Generally moderate to high limitations for urban development. Foundation hazard is moderate to high.

Rural Capability

Generally low to moderate limitations for cultivation. Generally low limitations for grazing.

Septic Absorption

Highly permeable, often waterlogged soils with low CEC and the presence of high watertables combine to create low suitability for septic disposal systems.

Appendix D – Radiation Survey

Radiation Survey

Stage 1 Skate Park and Recreation Area Sandhills Estate Lot 457 DP1087879 Middleton Street Byron Bay

HEALTH SCIENCE ENVIROMENTAL EDUCATION
ENVIRONMENTAL AUDITOR

Radiation Survey

Stage 1 Skate Park and Recreation Area Sandhills Estate Lot 457 DP1087879 Middleton Street Byron Bay

Prepared for: Byron Shire Council
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1. Introduction

Tim Fitzroy & Associates (TFA) has been engaged by Byron Shire Council (BSC) to undertake a safety assessment to determine radioactivity levels using the standards of the Australian Radiation Protection and Nuclear Safety (ARPANSA) Safety Guide' Management of Naturally Occurring Material (NORM) to accompany a Review of Environmental Factors (REF) for an area of approximately 1.2ha which is Stage 1 Skate Park and Recreation Area Sandhills Estate Lot 457 DP1087879 Middleton Street Byron Bay.

This assessment shall identify the extent and degree of any surface radioactivity present and shall identify any risks associated with the contamination. If contamination is identified the Preliminary Site Investigation (PSI) shall identify if remediation is required to make the site suitable for the proposed use and/or to protect human health and the environment.

Byron Bay has a history of mineral sand mining and in some cases, tailings being used around the town as fill. Mapping of mined areas indicates that this site may have been mined (see **Appendix A** Composite of Sand Mining Area Byron Bay 1958-1968). BSC has adopted the *precautionary principle* and elected to have a Radiation Survey conducted to assess the level of radioactivity of the surface and subsurface soils at the development site.

1.2 Scope of Works

This assessment has been undertaken to determine the relative risk associated with the proposed Stage 1 Skate Park and Recreation Area Sandhills Estate Lot 457 DP1087879 Middleton Street Byron Bay with respect to contamination with radioactive sands. The tasks involved in undertaking this assessment were to:

- undertake a radiation survey of the site to establish whether the site conforms with Australian Radiation Protection and Nuclear Safety (ARPANSA) Safety Guide' Management of Naturally Occurring Material (NORM), the National Health and Medical Research Standards and the NSW Environment Protection Authority Guidelines relating to the cleanup and disposal of residues from commercial operations involving mineral sands; and
- to confirm if the presence of any contaminates represents an unacceptable risk for the future proposed use.

2. Site Description and Proposed Development

2.1 Site Location

The subject site is described in planning terms as Stage 1 Skate Park and Recreation Area Sandhills Estate Lot 457 DP1087879 Middleton Street Byron Bay. As **Illustration 2.1** shows, the property is centrally located between the Byron Bay Courthouse, library, Early Childhood Centre and Youth Activties Service. **Illustration 2.1** shows the boundaries of the development site.

We understand that the Stage 1 concept plan includes a new skate park, improved pedestrian access, a boardwalk, a viewing platform, sculpture trail, expansion of eth Youth Activities Service as well as grassed and vegetated areas. The Stage 1 concept plan also involve the construction of footpaths and new carparking on Tennyson Street.

2.2 Proposed Development

The main areas that involve excavation are:

- New skate park;
- New footpaths; and
- Expansion of the Youth Activities Centre

The Activity footprint is approximately 1.2ha. A concept plan of the proposed development is provided in **Appendix A.**

Illustration 2.1 Site Locality Plan

2.3 Site History

Beach Sand Mining for the recovery of rutile, zircon, monazite and ilmenite was carried out in Byron Bay by Associated Minerals during the period 1934 to 1975 (Health Commission of NSW 1982). The plant was originally situated on the present site of the Woolworths Supermarket in Johnson Street.

In 1980 a resident of Byron Bay (a former employee of Associated Minerals) brought to the attention of the Byron Shire Council the possibility that land being developed for a residential estate (Pacific Vista) could be contaminated with thorium, as it was a site used by Associated Minerals for storing monazite.

Officers of the Radiation Branch of the NSW Health Commission visited the area on 26 April 1980 and again on 27 May 1980 to check for possible radioactive contamination. Contamination was found and a report of the survey was submitted to the Radiological Advisory Council on 12 September 1980 (Health Commission of NSW 1982).

The Radiological Advisory Council subsequently approved the land as suitable for residential development as the thorium had been removed from the area. It was further noted that the material removed from the estate had been buried at the Myocum landfill and that the landfill when completed, should not be used for housing development (Health Commission of NSW 1982).

Further concerns were raised by the public regarding other areas in Byron Bay which may be contaminated with monazite. Due to the widespread use of tailings as landfill it was decided to thoroughly investigate the Byron Bay township by conducting a house to house survey. The survey was conducted from 19 to 23 April 1982 (NSW Health Commission, May 1982).

Instrumentation used in the radiation survey included an Eberline PRM-7 and Berthold LB-1200 monitor. The primary concern in this survey was to establish if there were any more houses or buildings in addition to those previously reported that have been constructed over tailings such that the occupants could be exposed to unnecessary radiation (NSW Health Commission (May 1982).

The Health Commission radiation survey in April 1982 concentrated on land that had been filled for housing and did not include vacant land. The report does however list assessment of streets in alphabetical order where radiation levels were monitored. Mapping of mined areas indicates that this site may have been mined (see **Appendix B** Composite of Sand Mining Area Byron Bay 1958-1968, Byron Bay Historical Society 2015). BSC has adopted the *precautionary principle* and elected to have a Radiation Survey conducted to assess the level of radioactivity in the surface soils at the development site.

3. Radiation Survey

3.1 Site Assessment

Potential sources of radiation contamination at the subject site include:

- Naturally occurring mineral sands

These minerals are invariably highly insoluble and are generally associated with the mineral monazite, thorium and rare earth phosphate, or with zircon.

The National Health and Medical Research Council (NHMRC)* have adopted a set of standards relating to the cleanup and disposal of residues from commercial operations involving mineral sands. These standards cover:

- Action level criteria;
- Remedial action criteria;
- Disposal action criteria; and
- Protection of disposal sites.

For the purposes of this contaminated site assessment the action level criteria (NHMRC 1984)* have been adopted as follows:

Action Level Criteria

1. For dwellings, schools (including playgrounds), businesses, factories, etc. where occupancies by the same individuals occur regularly on a day by day basis, the remedial action level should be 0.7uSv.hr^{-1} for all points at 1 metre above the area of concern on the property.
2. For other areas, where occupancies are for a few hours per week by the same individuals or by differing individuals and for garden areas, the remedial action level should be 1.0uSv.hr^{-1} for all points at 1 metre above the surface.
3. For roads, paths, and other areas with intermittent occupancy, the remedial action level should be 2.5uSv.hr^{-1}
4. All values quoted above include a value for natural background of 0.1 uSv.hr^{-1}.

Background radiation is naturally present in our environment in variable amounts. People living on mineralised sands or in granite areas are exposed to more terrestrial radiation, while people living or working at higher altitudes are exposed to more cosmic radiation (World Nuclear Association, 2007). Exposure arising from unaltered natural radiation is deemed *uncontrollable* and to be excluded from the regulatory system (ICRP Publication 82, 2003).

**The NHMRC standards mirror RSIS no 12 (Radiation Safety Information Series) issued by New South Wales Department of Health in 1984, and still referred to by the*

NSW Environment Protection Authority, Radiation Control Branch). Present NSW EPA advice to developers of residential subdivision estates who find contamination arising from past Heavy Mineral Sands Mining has been to seek to remediate the site to a gamma does rate of about 0.35 micro Sieverts per hour.

In 2002 RSIS 12 was reviewed by the NSW EPA Radiation Control Branch, and found to be still supportable, based on more recent advice given in ICRP Publication 82, "Protection of the Public in Situations of Prolonged Radiation Exposure: The Application of the Commission's System of Radiological Protection to Controllable Radiation Exposure Due To Natural Sources and Long-Lived Radioactive Residues (publ. International Commission on Radiological Protection, 2003).

ICRP 82 stated that the remediation of pre-existing contamination in circumstances where eth annual does not exceed 10 milli Sieverts per year is never justified. For full time residential occupation this would imply a doesrate of 1.14 microsieverts per hour. Thus, the NSW guidance has significant inherent conservatism.

Table 3.1 describes the expected exposure to radiation that is likely to occur on an annual basis. As exposure to natural sources cannot be avoided and already exceeds the recommended dose limit, the limits are more relevant to artificial sources (MARCO 2002).

Table 3.1 Likely Annual Radiation Exposure Levels for a Single Person
(MARCO 2002, adapted from Merke & Ackland)

	Sources Dose in mSv/yr ($mSv=10^{-3}$ Sv)
Natural	
Cosmic radiation, sea level	0.3
Soil, rock, building materials	0.3
Human tissue ($_{40}K$, $_{226}Ra$)	0.4
Radon ($_{222}Rn$) in the air	2
Total	**3**
Artificial	
Medical & dental X-Rays	0.4
Nuclear Medicine	0.1
Nuclear power	0.01
TV tubes, industry	0.02
Nuclear test fallout	0.04
Total	**0.6**
Total from all sources	**3.6**

3.2 Methodology

Both surface and subsurface radiation readings were undertaken with the proposed refurbishment footprint across the subject site. Radiation levels were established using a Rotem Ram-Gene 1 Radiation Meter (Mark II), which detects beta and gamma radiation (ANSTO, 2000).

Surface Readings were taken with the instrument at 1 metre above ground level covering a grid pattern at 0.2 metre, (in accordance with NHMRC Standards) (see **Illustration 3.1**).

Illustration 1

Radiation Survey Stage 1

Skate Park and Sandhills Estate | Lot 457 DP1087879 | Middleton Street, Byron Bay

PREPARED BY:
tim fitzroy & associates

3.3 Results of Radiation Survey

The results of the Surface Radiation Survey are shown below in Table 3.2.

Table 3.2 Results of the Surface Radiation Survey

Project: Stage 1 Skate Park and Recreation Area Sandhills Estate Lot 457 DP1087879 Middleton Street Byron Bay.
Client: Byron Shire Council
Site Assessment Date: Thursday 17 September 2020

Area	Location	Radiation 1 metre above ground uSvhr^{-1}	Compliance (Yes/No)
West	North South	0.08 -0.14 0.08-0.16	Yes Yes
Central	North South	0.08-0.36 0.07-0.34	Yes Yes
East	North South	0.04-0.17 0.05-0.18	Yes Yes

Notes for Table 3.2:
Readings taken with a RAM-Gene II Radiation Meter.

3.4 Discussion

The results of radiation readings taken on 17 September 2020 indicate radiation levels were detected in the range of:

- 0.08 to 0.36 uSv.hr^{-1} at 1 metre above the ground surface

These levels are well below the action levels established by the National Health and Medical Research Council for a variety of land uses (see below):

Action Level Criteria

1. For dwellings, schools (including playgrounds), businesses, factories, etc. where occupancies by the same individuals occur regularly on a day by day basis, the remedial action level should be 0.7uSv.hr^{-1} for all points at 1 metre above the area of concern on the property.
2. For other areas, where occupancies are for a few hours per week by the same individuals or by differing individuals and for garden areas, the remedial action level should be 1.0uSv.hr^{-1} for all points at 1 metre above the surface.
3. For roads, paths, and other areas with intermittent occupancy, the remedial action level should be 2.5uSv.hr^{-1}

Note: All values quoted above include a value for natural background of 0.1 uSv.hr^{-1}.

Radiation readings were taken at 1 metre above ground surface (as recommended by the National Health & Medical Research Council) and relate to dose response calculations. In addition, radiation readings were taken below ground level at a number of locations that best represented excavations as part of the proposed works.

**The NHMRC standards mirror RSIS no 12 (Radiation Safety Information Series) issued by New South Wales Department of Health in 1984, and still referred to by the NSW Environment Protection Authority, Radiation Control Branch). Present NSW EPA advice to developers of residential subdivision estates who find contamination arising from past Heavy Mineral Sands Mining has been to seek to remediate the site to a gamma does rate of about 0.35 micro Sieverts per hour.*

In 2002 RSIS 12 was reviewed by the NSW EPA Radiation Control Branch, and found to be still supportable, based on more recent advice given in ICRP Publication 82, "Protection of the Public in Situations of Prolonged Radiation Exposure: The Application of the Commission's System of Radiological Protection to Controllable Radiation Exposure Due To Natural Sources and Long-Lived Radioactive Residues (publ. International Commission on Radiological Protection, 2003).

ICRP 82 stated that the remediation of pre-existing contamination in circumstances where eth annual does not exceed 10 milli Sieverts per year is never justified. For full time residential occupation this would imply a doesrate of 1.14 microsieverts per hour. Thus, the NSW guidance has significant inherent conservatism.

4. Conclusion

A Radiation Survey was carried out within the proposed Stage 1 Skate Park and Recreation Area Sandhills Estate Lot 457 DP1087879 Middleton Street Byron Bay as defined in **Illustration 3.1** on 11 October 2019.

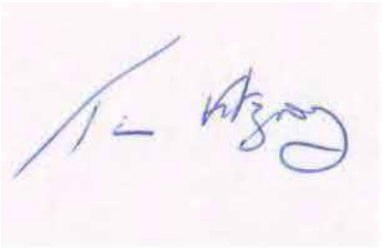
Radiation readings were undertaken across the proposed refurbishment envelope at 1 metre above the ground surface (as required by the standards). Radiation levels were established using a Rotem Ram-Gene II Radiation Meter (Mark II), which detects beta and gamma radiation (ANSTO, 2000).

The Radiation Survey revealed that the site complied with the Australian Radiation Protection and Nuclear Safety (ARPANSA) Safety Guide' Management of Naturally Occurring Material (NORM), the National Health and Medical Research Standards and the NSW Environment Protection Authority Guidelines relating to the cleanup and disposal of residues from commercial operations involving mineral sands for eth proposed uses.

The readings taken are not indicative of any hazard to human health or the environment arising from contamination from past sand extraction.

Based on the site history and site assessment, the proposed *Stage 1 Skate Park and Recreation Area Sandhills Estate Lot 457 DP1087879 Middleton Street Byron Bay* is deemed to be acceptable.

This report has been prepared by Tim Fitzroy of *Tim Fitzroy & Associates.*



Tim Fitzroy
Environmental Health Scientist
Environmental Auditor

References

Byron Bay Historical Society; 2015, Sand Mining in Byron Bay Area

Environment Protection Authority; 2003, NSW Radiation Series, Guideline on the Cleanup and Disposal of Radioactive residues from Operations Involving Mineral Sands, Environment Protection Authority, Sydney.

Department of Health, Radiation Branch, Radiation Information Series, No.12 Clean-up and Disposal of Radioactive Residues from commercial operations involving Minerals Sands; Department of Health, Lidcombe NSW

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Health Commission of NSW, Radiation Branch, May 1982, Radioactive Contamination in Byron Bay, The Third Report in Series on the Survey of Radiological Contamination resulting from Beach Sand Milling in Byron Bay and its Radiological Implications, Radiation Branch Health Commission, Lidcombe, NSW

National Health and Medical Research Council, 1984, guidelines for Remedial Action in areas where residues from Mineral Sand Mining and Processing have been detected, National Health & Medical research Council

Plummer & Smith, Sandhills Estate Landscape Linkages Plan

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Tim Fitzroy and Associates declares that does not have, nor expects to have, a beneficial interest in the subject project.

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Appendix E – ENM Report

ENV Solutions
ENVIRONMENTAL | ASBESTOS | REMEDIATION | RESOURCE RECOVERY

ENM VALIDATION REPORT

In Situ Classification
Tennyson Street, Byron Bay New South Wales 2481

For:
Planit Consulting

Date:
February 2024

ENV Services Pty Ltd
ABN 58 600 788 814
PO Box 248, Ballina NSW 2478
T: +61 428 910 445
E: admin@envsolutions.com.au
www.envsolutions.com.au

01 February 2024
Luke Wakefield
Planit Consulting

Re: ENM validation of soil Material surplus to redevelopment works at northern end of Tennyson Street, Byron Bay.

Dear Luke,

ENV Services Pty Ltd (ENV) was commissioned by Planit Consulting Pty Ltd (the client) to prepare this Excavated Natural Material (ENM) validation report for the beneficial re-use of soil material to be excavated from the proposed development area connecting Gilmore Crescent to the northern end of Tennyson Street, Byron Bay, NSW 2481 (the site). The regional location of the site is presented as Figure 1, Attachment 1.

ENV understand that approximately 1,200 m^2 of soil is to be excavated from a depth of 1.5 m bgl in drainage line areas and 1 m bgl in remaining areas as part of the extension of Tennyson Street's road corridor.

The material is surplus to the development and therefore requires classification to facilitate beneficial re-use off-site.

A site inspection and sampling program were undertaken by ENV Environmental Scientists from ENV on 18 January 2024. At the time of the site investigation, the excavation area comprised of a pedestrian pathway extending from Tennyson Street to Gilmore Crescent on the eastern portion of the site and an unused hardstand roadway along the western portion of the site. A section of vegetation runs through the centre of the site with mulch and grass covering open areas. The soil profile comprised sandy clays and sands, with no field indicators of contamination were observed with the exception of some refuse consisting of general rubbish, stone pavers and items of clothing.

Photographs from the site investigation are provided in Attachment 2.

In accordance with the requirements of the *Excavated Natural Material Order and Exemption (2014),* samples were collected from seven borehole locations targeting proposed drainage lines, to meet the minimum sampling density requirements for an area of up to approximately 1,200m^2. The sampling plan is illustrated as Figure 2, Attachment 1.

All sampling was undertaken in accordance with the requirements of the material-specific Order and Exemption published by the NSW EPA; being the *Excavated Natural Material Order and Exemption (2014).*

Land directly adjacent to the site is mapped as Class 3 with respect to Acid Sulfate Soils (ASS) by the Byron Shire Council (refer Figure 3, Attachment 1). In accordance with the Byron Local Environment Plan 2014, areas mapped as Class 3 require acid sulfate soil assessment for works below 1m depth. As excavation is occurring beyond 1 m bgl ASS samples were collected from 2 depth intervals from each borehole (1.0 & 1.0-1.5) in natural soils.

At each sample point, using a fresh pair of disposable nitrile glove, samples were collected directly from the augur. Samples were transferred into large clean snap lock bags (physical composition testing) and clean glass sampling jars provided by the laboratory (chemical analysis).

Each sample was analysed for the chemical parameters required by the *Order*. Physical contaminant samples were composited for foreign material analysis. Sample compositing details are presented as Table 1.

Table 1: Compositing Details

Primary Samples	Composite Sample
BH1-1	BH1-C
BH1-2	
BH2-1	BH2-C
BH2-2	
BH3-1	BH3-C
BH3-2	
BH4-1	BH4-C
BH4-2	
BH5-1	BH5-C
BH5-2	
BH6-1	BH6-C
BH6-2	
BH7-1	BH7-C
BH7-2	

Once collected, samples were stored in a chilled and insulated container and transported directly to the analytical laboratory for analysis (Eurofins, Sydney). Eurofins is accredited by the National Association of Testing Authorities (NATA) for these analyses.

Tabulated analytical results and laboratory analysis certificates are provided as Attachment 3.

ENM

A review of the results indicates the reported concentrations for each sample were below the allowable levels for ENM classification presented in Table 4 of the Order.

Acid Sulfate Soils

All ASS samples were analysed for Chromium Reducible Sulfur Suite. Excluding one, all remaining samples exceeded the ASSMAC (1998 and NASSIMM (2018) action criteria based on texture and volume of material disturbed. Liming rates (as reported by the laboratory) have been calculated for all sample locations. Results are presented in Table 2.

Table 2: Acid Sulfate Soil Results

Sample Location	Depth (m)	Texture	pH_{KCl}	Net Acidity (Non-Treated Soil) (mole H^+/tonne)	Net Acidity (Non-Treated Soil) Action Criterion* (mole H^+/tonne)	Potential Sulfidic Acidity (CRS) ($\%S_{cr}$)*	Potential Sulfidic Acidity (C_{RS}) Action Criterion ($\%S_{cr}$)*	Liming Rate (kg $CaCO_3$/tonne DW)
BH1-ASS1-1.5	1.5	**Coarse**	4.5	40	**18**	0.005	**0.03**	**3.0**
BH1-ASS2-2.0	2.0		4.5	44		<0.005		**3.3**
BH2-ASS1-1.0	1.0		4.3	57		0.005		**4.3**
BH2-ASS2-1.7	1.7		4.4	58		0.09		**4.4**
BH3-ASS1-1.5	1.5		4.9	<10		<0.005		**<1**
BH3-ASS2-2.0	2.0		4.5	35		0.010		**2.7**
BH4-ASS1-1.0	1.0		4.3	50		<0.005		**3.8**
BH4-ASS2-1.7	1.7		4.3	85		0.008		**6.4**
BH7-ASS1-1.5	1.5		4.3	56		<0.005		**4.2**
BH7-ASS2-2.5	2.5		4.3	69		<0.005		**4.4**

Conclusions

The investigation noted a mix of soils at varying depths across the site. For the purpose of consistency, a coarse texture has been adopted for the site. The results reported ASS from a depth of 1.0 to 2.5.

The ENM order stipulates that Excavated natural material does not include material that contains ASS.

As such, material excavated from bellow 1.0 m bgl will require treatment on site for ASS and validation, following which it may be sent to a local landfill facility. Alternatively, material will be accepted at resource recovery sites in QLD for offsite neutralisation.

These results allow material excavated from 0.0-1.0 m bgl, to be applied to land as engineering fill or for use in earthworks on the site of origin, or at other sites, as the soil is exempt from classification as a waste product.

The ENM Order and Exemption (2014) have the following requirements for notification and record keeping when carrying out work. These notification and record keeping requirements are best satisfied by keeping this Statement of Compliance for the 6 years required.

Notification:

On or before each transaction, the generator must provide the following to each person to whom the generator supplies the excavated natural material:

- A written statement of compliance certifying that all the requirements set out in the respective *Order* have been met (this report);
- A copy of the Exemption, or a link to the EPA website where they can be found; and
- A copy of the Order, or a link to the EPA website where they can be found.

A copy of the *Orders* and *Exemptions* are appended to this report (Attachment 4).

Record Keeping and Reporting:

Any person who applies or intends to apply these materials to land as fill must keep a written record of the following for a period of six years:

- The quantity of any materials received; and
- The name and address of the supplier of the materials received.

Should you have any queries about this Statement of Compliance, please don't hesitate to contact me directly.

Yours sincerely,

Jemma Attkins

Environmental Scientist

ENV Services Pty Ltd

Attachments:
1 – Figures
2 – Photolog
3 – Laboratory Results & Certificates
4 – Borelogs
5 – ENM Order 2014 & ENM Exemption 2014

Attachment 1 - Figures

Legend

Site Area (Approximate)

0 100 m 200 m

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Figure 1 – Site Location
Tennyson Street, Byron Bay NSW 2481

Job No: 240004
Client: Planit Consulting
Project: Tennyson Street Extension ENM

Image source: SIXMaps (2010)

Legend

Site Area (Approximate)

Borehole locations (Approximate)

0 15 m 30 m

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Figure 2 – Sampling Plan (Borehole locations)
Tennyson Street, Byron Bay NSW 2481

Job No: 240004
Client: Planit Consulting
Project: Tennyson Street Extension ENM

Image source: Six Maps (2015)

Legend

Site Area (Approximate)

0 10 20 m

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Figure 3 – Acid Sulfate Soil Map
Tennyson Street, Byron Bay NSW 2481

Job No: 240004
Client: Planit Consulting
Project: Tennyson Street Extension ENM

Image source: Byron Shire Council (2023)

Attachment 2 – Photolog

PHOTOGRAPHIC LOG

Client Name	Site Location	Project
Planit Consulting	Tennyson Street, Byron Bay NSW 2481	ENM and ASS Investigation

Photo No.	Date
1	18/1/2024

Description

Outlook of eastern portion of the site facing south.

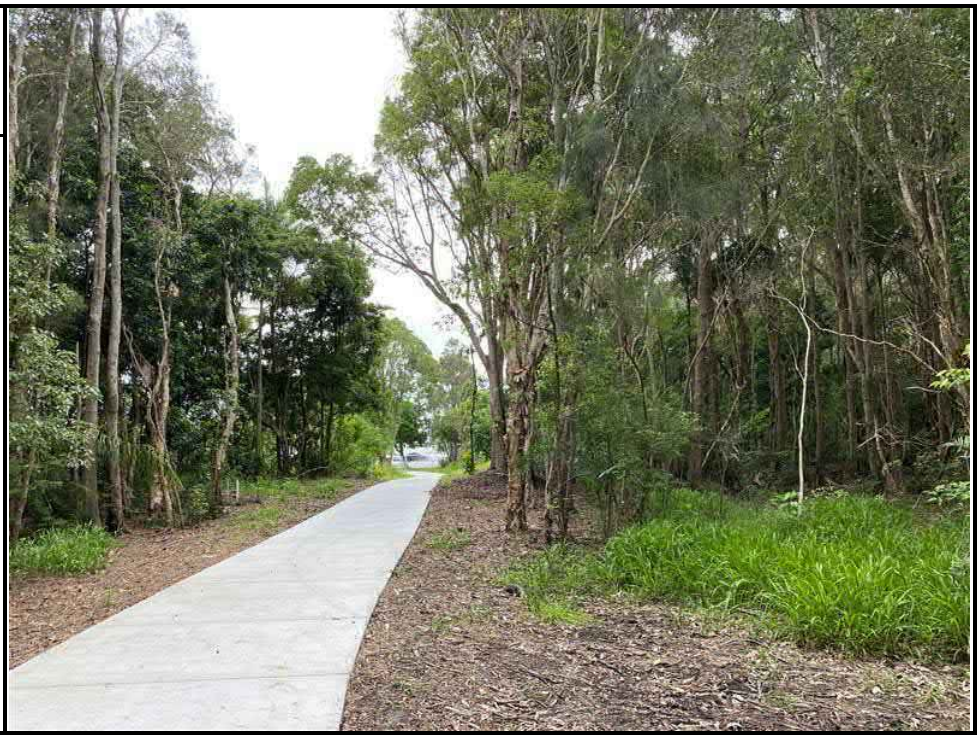

Photo No.	Date
	18/1/2024

Description

Vegetation comprising of main portion of the site. Some refuse present (clothing, general rubbish).

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PHOTOGRAPHIC LOG

Client Name	Site Location	Project
Planit Consulting	Tennyson Street, Byron Bay NSW 2481	ENM and ASS Investigation

Photo No.	Date
3	18/1/2024

Description

Sample location BH2.
Soils comprised of sandy CLAY.

Photo No.	Date
4	18/1/2024

Description

Sample location BH5, situated in road corridor on the western portion of the site, asphalt surface with gravely, sandy clays.

PHOTOGRAPHIC LOG

Client Name	Site Location	Project
Planit Consulting	Tennyson Street, Byron Bay NSW 2481	ENM and ASS Investigation

Photo No.	Date
5	18/1/2024

Description

Sample location BH7.

PHOTOGRAPHIC LOG

Client Name	Site Location	Project
Planit Consulting	Tennyson Street, Byron Bay NSW 2481	ENM and ASS Investigation

Photo No.	Date
6	18/1/2024

Description

Sample location BH3, comprising of sands.

PHOTOGRAPHIC LOG

Client Name	Site Location	Project
Planit Consulting	Tennyson Street, Byron Bay NSW 2481	ENM and ASS Investigation

Photo No.	Date
7	18/1/2024

Description

Refuse noted at BH7 (stone pavers)

Attachment 3 – Tabulated Results & Laboratory Documentation

Tennyson Street Extension ENM
Job No: 240004

Table 1 - Laboratory Analysis Results: Tennyson Street ENM Samples

				Particulates														
				Asphalt	Bitumen	Ceramic and Slag (other than blast furnace slag)	Clay lumps and other Friable Material	Cloth	Glass	Metal	Paint	Paper	Plaster	Plastic	Rubber	Stone	Vegetable matter	Wood	Extraneous Material
				%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
EQL				0.1	0.05	0.1	0.1	0.05	0.1	0.1	0.05	0.05	0.1	0.05	0.05	0.1	0.05	0.05	0.1
NSW 2014 Excavated Natural Material (Absolute Max)																			
NSW 2014 Excavated Natural Material (Max Average)																			
Lab Report Number	**Field ID**	**Date**	**Depth**																
1062185	**BH1-1**	**18 Jan 2024**																	
1062185	**BH1-2**	**18 Jan 2024**																	
1062185	**BH2-1**	**18 Jan 2024**																	
1062185	**BH2-2**	**18 Jan 2024**																	
1062185	**BH3-1**	**18 Jan 2024**																	
1062185	**BH3-2**	**18 Jan 2024**																	
1062185	**BH4-1**	**18 Jan 2024**																	
1062185	**BH4-2**	**18 Jan 2024**																	
1062185	**BH5-1**	**18 Jan 2024**																	
1062185	**BH5-2**	**18 Jan 2024**																	
1062185	**BH6-1**	**18 Jan 2024**																	
1062185	**BH6-2**	**18 Jan 2024**																	
1062185	**BH7-1**	**18 Jan 2024**																	
1062185	**BH7-2**	**18 Jan 2024**																	
1062185	**BH1-C**	**18 Jan 2024**		<0.1	<0.05	<0.1	**97**	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	**3.4**	<0.05	<0.05	
1062185	**BH2-C**	**18 Jan 2024**		<0.1	<0.05	<0.1	**98**	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	**2.1**	<0.05	<0.05	
1062185	**BH3-C**	**18 Jan 2024**		<0.1	<0.05	<0.1	**99**	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	**0.7**	<0.05	<0.05	
1062185	**BH4-C**	**18 Jan 2024**		<0.1	<0.05	<0.1	**95**	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	**4.7**	<0.05	<0.05	
1062185	**BH5-C**	**18 Jan 2024**		<0.1	<0.05	<0.1	**95**	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	**4.8**	<0.05	<0.05	
1062185	**BH6-C**	**18 Jan 2024**		<0.1	<0.05	<0.1	**96**	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	**4.0**	<0.05	<0.05	
1062185	**BH7-C**	**18 Jan 2024**		<0.1	<0.05	<0.1	**97**	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	**3.0**	<0.05	<0.05	
Statistics																			
Maximum Concentration				**<0.1**	**<0.05**	**<0.1**	**99**	**<0.05**	**<0.1**	**<0.1**	**<0.05**	**<0.05**	**<0.1**	**<0.05**	**<0.05**	**4.8**	**<0.05**	**<0.05**	

Environmental Standards
NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Absolute Max)
NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Max Average)

Tennyson Street Extension ENM
Job No: 240004

Table 1 - Laboratory Analysis Results: Tennyson Street ENM Samples

				BTEX							TRH								Inorganics			Metals							
				Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10 Fraction	F1 (C6-C10 minus BTEX)	>C10-C16 Fraction	F2 (>C10-C16 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	Conductivity (1:5 aqueous extract)	Moisture Content (dried @ 103°C)	pH (1:5 aqueous extract)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µS/cm	%	-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.5	0.1	0.1	0.1	0.2	0.1	0.3	20	20	50	50	100	100	100	10	1	0.1	2	0.4	5	5	5	0.1	5	5
NSW 2014 Excavated Natural Material (Absolute Max)					0.5	65	25			15											40	1	150	200	100	1	60	300
NSW 2014 Excavated Natural Material (Max Average)																					20	0.5	75	100	50	0.5	30	150
Lab Report Number	**Field ID**	**Date**	**Depth**																										
1062185	**BH1-1**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**25**	**16**	**4.7**	**5.2**	<0.4	**14**	<5	<5	<0.1	<5	**9.0**
1062185	**BH1-2**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**43**	**17**	**4.4**	**12**	<0.4	**19**	**7.3**	**5.8**	<0.1	<5	**11**
1062185	**BH2-1**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	<10	**14**	**4.9**	**8.7**	<0.4	**17**	<5	**6.1**	<0.1	<5	<5
1062185	**BH2-2**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**10**	**13**	**4.9**	**8.2**	<0.4	**17**	<5	**6.8**	<0.1	<5	**6.6**
1062185	**BH3-1**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**16**	**7.1**	**4.9**	<2	<0.4	<5	<5	<5	<0.1	<5	<5
1062185	**BH3-2**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**40**	**18**	**4.7**	<2	<0.4	<5	<5	<5	<0.1	<5	<5
1062185	**BH4-1**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**87**	**13**	**4.2**	**6.9**	<0.4	**16**	<5	<5	<0.1	<5	**5.9**
1062185	**BH4-2**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**50**	**15**	**4.6**	**10**	<0.4	**23**	<5	**5.7**	<0.1	<5	**5.8**
1062185	**BH5-1**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**130**	**9.4**	**4.2**	**4.0**	<0.4	**11**	<5	<5	<0.1	<5	<5
1062185	**BH5-2**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**150**	**9.9**	**4.3**	**5.1**	<0.4	**15**	<5	<5	<0.1	<5	<5
1062185	**BH6-1**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**200**	**11**	**4.2**	**16**	<0.4	**16**	<5	**6.0**	<0.1	<5	**7.7**
1062185	**BH6-2**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**160**	**16**	**4.1**	**14**	<0.4	**23**	<5	**6.5**	<0.1	<5	**6.6**
1062185	**BH7-1**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**210**	**16**	**4.2**	**12**	<0.4	**22**	<5	**5.1**	<0.1	<5	**8.7**
1062185	**BH7-2**	**18 Jan 2024**		<0.5	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<20	<20	<50	<50	<100	<100	<100	**190**	**13**	**4.6**	**9.6**	<0.4	**23**	<5	**6.5**	<0.1	<5	**8.4**
1062185	**BH1-C**	**18 Jan 2024**																											
1062185	**BH2-C**	**18 Jan 2024**																											
1062185	**BH3-C**	**18 Jan 2024**																											
1062185	**BH4-C**	**18 Jan 2024**																											
1062185	**BH5-C**	**18 Jan 2024**																											
1062185	**BH6-C**	**18 Jan 2024**																											
1062185	**BH7-C**	**18 Jan 2024**																											
Statistics																													
Maximum Concentration				**<0.5**	**<0.1**	**<0.1**	**<0.1**	**<0.2**	**<0.1**	**<0.3**	**<20**	**<20**	**<50**	**<50**	**<100**	**<100**	**<100**	**210**	**21**	**4.9**	**16**	**<0.4**	**23**	**7.3**	**6.8**	**<0.1**	**<5**	**11**

Environmental Standards
NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Absolute Max)
NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Max Average)

Tennyson Street Extension ENM
Job No: 240004

Table 1 - Laboratory Analysis Results: Tennyson Street ENM Samples

				PAH																			TPH				
				Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ calc (Zero)	PAHs (Sum of total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	20	20	50	50	50
NSW 2014 Excavated Natural Material (Absolute Max)								1															40					500
NSW 2014 Excavated Natural Material (Max Average)								0.5															20					250
Lab Report Number	**Field ID**	**Date**	**Depth**																									
1062185	**BH1-1**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH1-2**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH2-1**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH2-2**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH3-1**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH3-2**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH4-1**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH4-2**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH5-1**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH5-2**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH6-1**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH6-2**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH7-1**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH7-2**	**18 Jan 2024**		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**1.2**	<0.5	<0.5	<20	<20	<50	<50	<50
1062185	**BH1-C**	**18 Jan 2024**																										
1062185	**BH2-C**	**18 Jan 2024**																										
1062185	**BH3-C**	**18 Jan 2024**																										
1062185	**BH4-C**	**18 Jan 2024**																										
1062185	**BH5-C**	**18 Jan 2024**																										
1062185	**BH6-C**	**18 Jan 2024**																										
1062185	**BH7-C**	**18 Jan 2024**																										
Statistics																												
Maximum Concentration				**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	0.6	1.2	**<0.5**	**<0.5**	**<20**	**<20**	**<50**	**<50**	**<50**

Environmental Standards
NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Absolute Max)
NSW EPA, November 2014, NSW 2014 Excavated Natural Material (Max Average)

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

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☐ Perth Laboratory
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☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	ENV Solutions	Project №	240004	Project Manager	BP
Address	313 River St Ballina PO Box 248 Ballina NSW 2478	Project Name	Tennyson Street Extension	EDD Format (ESdat, EQuIS etc)	esdat
Contact Name	Jemma Attkins				
Phone №	0492 847949				
Special Directions	Results to jemma.attkins@envsolutions.com.au				
Purchase Order					
Quote ID №					

Sampler(s)	JA	
Handed over by	JA	
Email for Invoice	accounts@envsolutions.com.au	
Email for Results	labresults@envsolutions.com.au	

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to direct testing.

Containers — Change container type & size if necessary

Required Turnaround Time (TAT) — Default will be 5 days if not ticked

*Surcharge will apply
☐ Overnight (reporting by 9am)*
☐ Same day* ☐ 1 day*
☐ 2 days* ☑ 3 days*
☐ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	R16	Chromium Reducible Sulfur	(Foreign Material composite bag)	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH1-1	18/01/24	S	X											Not for foreign material anaylsis
2	BH1-2	18/1/24	S	X											Not for foreign material anaylsis
3	BH1-ASS1-1.5	18/1/24	S		X										
4	BH1-ASS2-2.0	18/1/24	S		X										
5	BH1-C	18/1/24	S			X									as part of R16
6	BH2-1	18/1/24	S	X											Not foreign material anaylsis
7	BH2-2	18/1/24	S	X											Not for foreign material anaylsis
8	BH2-ASS1-1.0	18/1/24	S		X										
9	BH2-ASS2-1.7	18/1/24	S		X										
10	BH2-C	18/1/24	S			X									as part of R16
	Total Counts			4	4	2									

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal — Name — Signature — Date — Time

Laboratory Use Only

Received By	Brendan Crosby	(SYD) / BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 29/1/24	Time 10:15	Temperature 21
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report №

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request

FM R9 under roller 1062185

CHAIN OF CUSTODY RECORD

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☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	ENV Solutions	Project №	240004	Project Manager	BP
Address	313 River St Ballina PO Box 248 Ballina NSW 2478	Project Name	Tennyson Street Extension	EDD Format (ESdat, EQuIS etc)	esdat
Contact Name	Jemma Attkins				
Phone №	0492 847949				
Special Directions	Results to jemma.attkins@envsolutions.com.au				
Purchase Order					
Quote ID №					

Sampler(s)	JA
Handed over by	JA
Email for Invoice	accounts@envsolutions.com.au
Email for Results	labresults@envsolutions.com.au

Analyses — Where multiple analytes are requested, please specify "Total" or "Filtered". SUITE code must be used to obtain SUITE pricing

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	R16	Chromium Reducible Sulfur	(Foreign Material composite bag)	Containers — Change container type & size if necessary: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH3-1	18/01/24	S	X											Not for foreign material anaylsis
2	BH3-2	18/1/24	S	X											Not for foreign material anaylsis
3	BH3-ASS1-1.5	18/1/24	S		X										
4	BH3-ASS2-2.0	18/1/24	S		X										
5	BH3-C	18/1/24	S			X									as part of R16
6	BH4-1	18/1/24	S	X											Not foreign material anaylsis
7	BH4-2	18/1/24	S	X											Not for foreign material anaylsis
8	BH4-ASS1-1.0	18/1/24	S		X										
9	BH4-ASS2-1.7	18/1/24	S		X										
10	BH4-C	18/1/24	S			X									as part of R16
	Total Counts			4	4	2									

Required Turnaround Time (TAT) — Default will be 5 days if not ticked

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☑ 3 days♦
- ☐ 5 days (Standard)
- ☐ Other( )

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Name | Signature | Date | Time

Laboratory Use Only

Received By	Brandon Cowling	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time

Temperature | Report №

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

CHAIN OF CUSTODY RECORD

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☐ Melbourne Laboratory
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+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	ENV Solutions	Project No	240004	Project Manager	BP
Address	313 River St Ballina PO Box 248 Ballina NSW 2478	Project Name	Tennyson Street Extension	EDD Format (Excel, EDuS etc.)	esdat
Contact Name	Jemma Atkins				
Phone No	0492 847949				
Special Directions	Results to jemma.atkins@envsolutions.com.au				
Purchase Order					
Quote ID No					

Sampler(s)	JA
Handed over by	JA
Email for Invoice	accounts@envsolutions.com.au
Email for Results	labresults@envsolutions.com.au

Analyses (Where metals are required, please specify Total or Filtered. Specific code must be used to ensure correct SUITE pricing)

No	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix Soil (S) Water (W)	R16	Chromium Reducible Sulfur	(Foreign Material composite bag)
1	BH5-1	18/01/24	S	X		
2	BH5-2	18/1/24	S	X		
3	BH5-C	18/1/24	S			X
4	BH6-1	18/1/24	S	X		
5	BH6-2	18/1/24	S	X		
6	BH6-C	18/1/24	S			X
7	BH7-1	18/1/24	S	X		
8	BH7-2	18/1/24	S	X		
9	BH7-ASS1-1.5	18/1/24	S		X	
10	BH3-ASS2-2.5	18/1/24	S		X	
	Total Counts			6	2	2

Containers (Change container type & size if necessary)

500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
								Not for foreign material anaylsis
								Not for foreign material anaylsis
								as part of R16
								Not foreign material anaylsis
								Not for foreign material anaylsis
								as part of R16
								Not foreign material anaylsis
								Not for foreign material anaylsis

Required Turnaround Time (TAT) (Default will be 5 days if not ticked)

*Surcharge will apply

- ☐ Overnight (reporting by 9am)*
- ☐ Same day* ☐ 1 day*
- ☐ 2 days* ☑ 3 days*
- ☐ 5 days (Standard)
- ☐ Other( )

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date		Time	
Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report No	

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

CHAIN OF CUSTODY RECORD

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☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
+61 3 8564 5000 EnviroSampleVic@eurofins.com

Company	ENV Solutions
Address	313 River St Ballina PO Box 248 Ballina NSW 2478
Contact Name	Jemma Atkins
Phone №	0492 847949
Special Directions	Results to jemma.attkins@envsolutions.com.au
Purchase Order	
Quote ID №	

Project №	240004
Project Name	Tennyson Street Extension
Project Manager	BP
EDD Format (ESdat, EQuIS etc)	esdat
Sampler(s)	JA
Handed over by	JA
Email for Invoice	accounts@envsolutions.com.au
Email for Results	labresults@envsolutions.com.au

Analyses (Where metals are requested, please specify "Total" or "Filtered". SUITE codes must be used to obtain a SUITE price)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix Solid (S) Water (W)	R16 Chromium Reducible Sulfur	(Foreign Material composite bag)	Containers (Change container type & size if necessary): 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH7-C	18/01/24	S		✖									as part of R16
2														
3														
4														
5														
6														
7														
8														
9														
10														
	Total Counts				1									

Required Turnaround Time (TAT) (Default will be 5 days if not ticked)

*Surcharge will apply

☐ Overnight (reporting by 9am)*
☐ Same day* ☐ 1 day*
☐ 2 days* ☑ 3 days*
☐ 5 days (Standard)
☐ Other( )

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name		Signature		Date	Time
Laboratory Use Only	Received By	Brendan Cowley	SYD ⓑ BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	29/1/24	Time	10:15
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time	

Time: Temperature: Uncooled
Report №:

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

COC001 R11 Modified by D. Bennett Approved by J. Wong Approved on 15 March 2022

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	ENV Services Pty Ltd
Contact name:	Ben Pieterse
Project name:	TENNYSON STREET EXTENSION
Project ID:	240004
Turnaround time:	3 Day
Date/Time received	Jan 24, 2024 10:15 AM
Eurofins reference	1062185

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Bonnie Pu on phone : or by email: BonniePu@eurofins.com

Results will be delivered electronically via email to Ben Pieterse - ben@envsolutions.com.au.

Note: A copy of these results will also be delivered to the general ENV Services Pty Ltd email address.

ENV Services Pty Ltd
313 River Street
Ballina
NSW 2478

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Ben Pieterse**

Report **1062185-S**
Project name TENNYSON STREET EXTENSION
Project ID 240004
Received Date Jan 24, 2024

Client Sample ID			**BH1-1**	**BH1-2**	**BH1-ASS1-1.5**	**BH1-ASS2-2.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S24-Ja0037077**	**S24-Ja0037078**	**S24-Ja0037079**	**S24-Ja0037080**
Date Sampled			**Jan 18, 2024**	**Jan 18, 2024**	**Jan 18, 2024**	**Jan 18, 2024**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	-	-
TRH C10-C14	20	mg/kg	< 20	< 20	-	-
TRH C15-C28	50	mg/kg	< 50	< 50	-	-
TRH C29-C36	50	mg/kg	< 50	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	-	-
TRH C6-C10	20	mg/kg	< 20	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	-	-
TRH >C10-C16	50	mg/kg	< 50	< 50	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	-	-
TRH >C16-C34	100	mg/kg	< 100	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	-
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	84	86	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	-

Client Sample ID			BH1-1	BH1-2	BH1-ASS1-1.5	BH1-ASS2-2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037077	S24-Ja0037078	S24-Ja0037079	S24-Ja0037080
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	75	96	-	-
p-Terphenyl-d14 (surr.)	1	%	84	108	-	-
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	25	43	-	-
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	4.7	4.4	-	-
Heavy Metals						
Arsenic	2	mg/kg	5.2	12	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	-
Chromium	5	mg/kg	14	19	-	-
Copper	5	mg/kg	< 5	7.3	-	-
Lead	5	mg/kg	< 5	5.8	-	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	-
Nickel	5	mg/kg	< 5	< 5	-	-
Zinc	5	mg/kg	9.0	11	-	-
Sample Properties						
% Moisture	1	%	16	17	14	15
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	-	-	4.5	4.5
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	-	-	37	44
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	-	-	0.060	0.071
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	-	-	0.005	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	-	-	3.3	< 3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	-	-	N/A	0.011
HCl Extractable Sulfur	0.005	% S	-	-	N/A	0.015
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	-	-	N/A	< 0.005
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	-	-	N/A	< 0.005
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	-	-	N/A	< 2
HCl Extractable Sulfur Correction Factor	1	factor	-	-	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	-	-	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	-	-	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	-	-	N/A	N/A
ANC Fineness Factor		factor	-	-	1.5	1.5
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	-	-	0.07	0.07
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	-	-	40	44
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	-	-	3.0	3.3

Client Sample ID			BH1-1	BH1-2	BH1-ASS1-1.5	BH1-ASS2-2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037077	S24-Ja0037078	S24-Ja0037079	S24-Ja0037080
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	-	130	180
>2mm Fraction	0.005	g	-	-	52	47
Analysed Material	0.1	%	-	-	71	79
Extraneous Material	0.1	%	-	-	29	21

Client Sample ID			BH1-C	BH2-1	BH2-2	BH2-ASS1-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037081	S24-Ja0037082	S24-Ja0037083	S24-Ja0037084
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	< 20	< 20	-
TRH C10-C14	20	mg/kg	-	< 20	< 20	-
TRH C15-C28	50	mg/kg	-	< 50	< 50	-
TRH C29-C36	50	mg/kg	-	< 50	< 50	-
TRH C10-C36 (Total)	50	mg/kg	-	< 50	< 50	-
TRH C6-C10	20	mg/kg	-	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	-
TRH >C10-C16	50	mg/kg	-	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 50	-
TRH >C16-C34	100	mg/kg	-	< 100	< 100	-
TRH >C34-C40	100	mg/kg	-	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	< 100	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	-
Xylenes - Total*	0.3	mg/kg	-	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	74	83	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	1.2	-
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-

Client Sample ID			BH1-C	BH2-1	BH2-2	BH2-ASS1-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037081	S24-Ja0037082	S24-Ja0037083	S24-Ja0037084
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	-	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	92	92	-
p-Terphenyl-d14 (surr.)	1	%	-	107	114	-
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	-	< 10	10	-
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	-	4.9	4.9	-
Heavy Metals						
Arsenic	2	mg/kg	-	8.7	8.2	-
Cadmium	0.4	mg/kg	-	< 0.4	< 0.4	-
Chromium	5	mg/kg	-	17	17	-
Copper	5	mg/kg	-	< 5	< 5	-
Lead	5	mg/kg	-	6.1	6.8	-
Mercury	0.1	mg/kg	-	< 0.1	< 0.1	-
Nickel	5	mg/kg	-	< 5	< 5	-
Zinc	5	mg/kg	-	< 5	6.6	-
Sample Properties						
% Moisture	1	%	-	14	13	15
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	-	-	-	4.3
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	-	-	-	47
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	-	-	-	0.076
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	-	-	-	0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	-	-	-	3.3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	-	-	-	< 0.005
HCl Extractable Sulfur	0.005	% S	-	-	-	0.007
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	-	-	-	0.014
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	-	-	-	0.010
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	-	-	-	6.5
HCl Extractable Sulfur Correction Factor	1	factor	-	-	-	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	-	-	-	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	-	-	-	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	-	-	-	N/A
ANC Fineness Factor		factor	-	-	-	1.5
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	-	-	-	0.09
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	-	-	-	57
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	-	-	-	4.3

Client Sample ID			BH1-C	BH2-1	BH2-2	BH2-ASS1-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037081	S24-Ja0037082	S24-Ja0037083	S24-Ja0037084
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	-	-	-	130
>2mm Fraction	0.005	g	-	-	-	41
Analysed Material	0.1	%	-	-	-	76
Extraneous Material	0.1	%	-	-	-	24
Foreign Materials - ENM						
Initial Weight	0.01	kg	4.0	-	-	-
Foreign Material - Type I						
Metal*	0.1	%	< 0.1	-	-	-
Glass*	0.1	%	< 0.1	-	-	-
Asphalt*	0.1	%	< 0.1	-	-	-
Stone*	0.1	%	3.4	-	-	-
Ceramic and slag (other than blast furnace slag)*	0.1	%	< 0.1	-	-	-
Foreign Material - Type II						
Plaster*	0.1	%	< 0.1	-	-	-
Clay lumps and other friable material*	0.1	%	97	-	-	-
Foreign Material - Type III						
Rubber*	0.05	%	< 0.05	-	-	-
Plastic*	0.05	%	< 0.05	-	-	-
Bitumen*	0.05	%	< 0.05	-	-	-
Paper*	0.05	%	< 0.05	-	-	-
Cloth*	0.05	%	< 0.05	-	-	-
Paint*	0.05	%	< 0.05	-	-	-
Wood*	0.05	%	< 0.05	-	-	-
Vegetable matter*	0.05	%	< 0.05	-	-	-

Client Sample ID			BH2-ASS2-1.7	BH2-C	BH3-1	BH3-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037085	S24-Ja0037086	S24-Ja0037087	S24-Ja0037088
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	-	< 20	< 20
TRH C10-C14	20	mg/kg	-	-	< 20	< 20
TRH C15-C28	50	mg/kg	-	-	< 50	< 50
TRH C29-C36	50	mg/kg	-	-	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	-	-	< 50	< 50
TRH C6-C10	20	mg/kg	-	-	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	< 20
TRH >C10-C16	50	mg/kg	-	-	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	< 50
TRH >C16-C34	100	mg/kg	-	-	< 100	< 100
TRH >C34-C40	100	mg/kg	-	-	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	-	< 100	< 100

Client Sample ID			BH2-ASS2-1.7	BH2-C	BH3-1	BH3-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037085	S24-Ja0037086	S24-Ja0037087	S24-Ja0037088
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	-	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	-	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	81	74
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	< 0.5
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	1.2
Acenaphthene	0.5	mg/kg	-	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	-	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	-	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	-	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	-	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	-	92	96
p-Terphenyl-d14 (surr.)	1	%	-	-	106	113
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	-	-	16	40
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	-	-	4.9	4.7
Heavy Metals						
Arsenic	2	mg/kg	-	-	< 2	< 2
Cadmium	0.4	mg/kg	-	-	< 0.4	< 0.4
Chromium	5	mg/kg	-	-	< 5	< 5
Copper	5	mg/kg	-	-	< 5	< 5
Lead	5	mg/kg	-	-	< 5	< 5
Mercury	0.1	mg/kg	-	-	< 0.1	< 0.1
Nickel	5	mg/kg	-	-	< 5	< 5
Zinc	5	mg/kg	-	-	< 5	< 5
Sample Properties						
% Moisture	1	%	16	-	7.1	18
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	4.4	-	-	-
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	49	-	-	-
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.078	-	-	-

Client Sample ID			BH2-ASS2-1.7	BH2-C	BH3-1	BH3-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037085	S24-Ja0037086	S24-Ja0037087	S24-Ja0037088
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	0.005	-	-	-
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	3.3	-	-	-
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	< 0.005	-	-	-
HCl Extractable Sulfur	0.005	% S	0.007	-	-	-
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	0.014	-	-	-
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	0.010	-	-	-
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	6.4	-	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	-	-	-
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	-	-	-
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	-	-	-
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	-	-	-
ANC Fineness Factor		factor	1.5	-	-	-
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.09	-	-	-
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	58	-	-	-
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	4.4	-	-	-
Extraneous Material						
<2mm Fraction	0.005	g	170	-	-	-
>2mm Fraction	0.005	g	47	-	-	-
Analysed Material	0.1	%	78	-	-	-
Extraneous Material	0.1	%	22	-	-	-
Foreign Materials - ENM						
Initial Weight	0.01	kg	-	3.5	-	-
Foreign Material - Type I						
Metal*	0.1	%	-	< 0.1	-	-
Glass*	0.1	%	-	< 0.1	-	-
Asphalt*	0.1	%	-	< 0.1	-	-
Stone*	0.1	%	-	2.1	-	-
Ceramic and slag (other than blast furnace slag)*	0.1	%	-	< 0.1	-	-
Foreign Material - Type II						
Plaster*	0.1	%	-	< 0.1	-	-
Clay lumps and other friable material*	0.1	%	-	98	-	-
Foreign Material - Type III						
Rubber*	0.05	%	-	< 0.05	-	-
Plastic*	0.05	%	-	< 0.05	-	-
Bitumen*	0.05	%	-	< 0.05	-	-
Paper*	0.05	%	-	< 0.05	-	-
Cloth*	0.05	%	-	< 0.05	-	-
Paint*	0.05	%	-	< 0.05	-	-
Wood*	0.05	%	-	< 0.05	-	-
Vegetable matter*	0.05	%	-	< 0.05	-	-

Client Sample ID			BH3-ASS1-1.5	BH3-ASS2-2.0	BH3-C	BH4-1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037089	S24-Ja0037090	S24-Ja0037091	S24-Ja0037092
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	-	-	-	< 20
TRH C10-C14	20	mg/kg	-	-	-	< 20
TRH C15-C28	50	mg/kg	-	-	-	< 50
TRH C29-C36	50	mg/kg	-	-	-	< 50
TRH C10-C36 (Total)	50	mg/kg	-	-	-	< 50
TRH C6-C10	20	mg/kg	-	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	-	< 20
TRH >C10-C16	50	mg/kg	-	-	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	-	< 50
TRH >C16-C34	100	mg/kg	-	-	-	< 100
TRH >C34-C40	100	mg/kg	-	-	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	-	-	< 100
BTEX						
Benzene	0.1	mg/kg	-	-	-	< 0.1
Toluene	0.1	mg/kg	-	-	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Xylenes - Total*	0.3	mg/kg	-	-	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	-	71
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	-	< 0.5
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	-	1.2
Acenaphthene	0.5	mg/kg	-	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	-	< 0.5
Anthracene	0.5	mg/kg	-	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	-	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	-	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Chrysene	0.5	mg/kg	-	-	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	-	< 0.5
Fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Fluorene	0.5	mg/kg	-	-	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	-	< 0.5
Naphthalene	0.5	mg/kg	-	-	-	< 0.5
Phenanthrene	0.5	mg/kg	-	-	-	< 0.5
Pyrene	0.5	mg/kg	-	-	-	< 0.5
Total PAH*	0.5	mg/kg	-	-	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	-	-	96
p-Terphenyl-d14 (surr.)	1	%	-	-	-	109
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	-	-	-	87
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	-	-	-	4.2

Client Sample ID			BH3-ASS1-1.5	BH3-ASS2-2.0	BH3-C	BH4-1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037089	S24-Ja0037090	S24-Ja0037091	S24-Ja0037092
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	-	-	-	6.9
Cadmium	0.4	mg/kg	-	-	-	< 0.4
Chromium	5	mg/kg	-	-	-	16
Copper	5	mg/kg	-	-	-	< 5
Lead	5	mg/kg	-	-	-	< 5
Mercury	0.1	mg/kg	-	-	-	< 0.1
Nickel	5	mg/kg	-	-	-	< 5
Zinc	5	mg/kg	-	-	-	5.9
Sample Properties						
% Moisture	1	%	13	20	-	13
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	4.9	4.5	-	-
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	8.8	22	-	-
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.014	0.035	-	-
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	0.010	-	-
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	6.4	-	-
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	N/A	< 0.005	-	-
HCl Extractable Sulfur	0.005	% S	N/A	0.008	-	-
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	0.015	-	-
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	0.011	-	-
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	7.2	-	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	-	-
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	-	-
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	-	-
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	-	-
ANC Fineness Factor		factor	1.5	1.5	-	-
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	< 0.02	0.06	-	-
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	< 10	35	-	-
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	< 1	2.7	-	-
Extraneous Material						
<2mm Fraction	0.005	g	220	210	-	-
>2mm Fraction	0.005	g	< 0.005	61	-	-
Analysed Material	0.1	%	100	77	-	-
Extraneous Material	0.1	%	< 0.1	23	-	-
Foreign Materials - ENM						
Initial Weight	0.01	kg	-	-	5.2	-
Foreign Material - Type I						
Metal*	0.1	%	-	-	< 0.1	-
Glass*	0.1	%	-	-	< 0.1	-
Asphalt*	0.1	%	-	-	< 0.1	-
Stone*	0.1	%	-	-	0.7	-
Ceramic and slag (other than blast furnace slag)*	0.1	%	-	-	< 0.1	-

Client Sample ID			BH3-ASS1-1.5	BH3-ASS2-2.0	BH3-C	BH4-1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037089	S24-Ja0037090	S24-Ja0037091	S24-Ja0037092
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Foreign Material - Type II						
Plaster*	0.1	%	-	-	< 0.1	-
Clay lumps and other friable material*	0.1	%	-	-	99	-
Foreign Material - Type III						
Rubber*	0.05	%	-	-	< 0.05	-
Plastic*	0.05	%	-	-	< 0.05	-
Bitumen*	0.05	%	-	-	< 0.05	-
Paper*	0.05	%	-	-	< 0.05	-
Cloth*	0.05	%	-	-	< 0.05	-
Paint*	0.05	%	-	-	< 0.05	-
Wood*	0.05	%	-	-	< 0.05	-
Vegetable matter*	0.05	%	-	-	< 0.05	-

Client Sample ID			BH4-2	BH4-ASS1-1.0	BH4-ASS2-1.7	BH4-C
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037093	S24-Ja0037094	S24-Ja0037095	S24-Ja0037096
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	-	-	-
TRH C10-C14	20	mg/kg	< 20	-	-	-
TRH C15-C28	50	mg/kg	< 50	-	-	-
TRH C29-C36	50	mg/kg	< 50	-	-	-
TRH C10-C36 (Total)	50	mg/kg	< 50	-	-	-
TRH C6-C10	20	mg/kg	< 20	-	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-	-
TRH >C10-C16	50	mg/kg	< 50	-	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-	-
TRH >C16-C34	100	mg/kg	< 100	-	-	-
TRH >C34-C40	100	mg/kg	< 100	-	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Xylenes - Total*	0.3	mg/kg	< 0.3	-	-	-
4-Bromofluorobenzene (surr.)	1	%	84	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			BH4-2	BH4-ASS1-1.0	BH4-ASS2-1.7	BH4-C
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037093	S24-Ja0037094	S24-Ja0037095	S24-Ja0037096
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	-
Fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-	-
2-Fluorobiphenyl (surr.)	1	%	96	-	-	-
p-Terphenyl-d14 (surr.)	1	%	104	-	-	-
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	50	-	-	-
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	4.6	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	10	-	-	-
Cadmium	0.4	mg/kg	< 0.4	-	-	-
Chromium	5	mg/kg	23	-	-	-
Copper	5	mg/kg	< 5	-	-	-
Lead	5	mg/kg	5.7	-	-	-
Mercury	0.1	mg/kg	< 0.1	-	-	-
Nickel	5	mg/kg	< 5	-	-	-
Zinc	5	mg/kg	5.8	-	-	-
Sample Properties						
% Moisture	1	%	15	20	21	-
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	-	4.3	4.3	-
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	-	50	75	-
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	-	0.081	0.12	-
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	-	< 0.005	0.008	-
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	-	< 3	4.7	-
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	-	0.008	0.006	-
HCl Extractable Sulfur	0.005	% S	-	0.010	0.012	-
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	-	< 0.005	0.013	-
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	-	< 0.005	0.009	-
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	-	< 2	5.9	-
HCl Extractable Sulfur Correction Factor	1	factor	-	2.0	2.0	-
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	-	N/A	N/A	-
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	-	N/A	N/A	-
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	-	N/A	N/A	-
ANC Fineness Factor		factor	-	1.5	1.5	-

Client Sample ID			BH4-2	BH4-ASS1-1.0	BH4-ASS2-1.7	BH4-C
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037093	S24-Ja0037094	S24-Ja0037095	S24-Ja0037096
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	-	0.08	0.14	-
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	-	50	85	-
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	-	3.8	6.4	-
Extraneous Material						
<2mm Fraction	0.005	g	-	110	120	-
>2mm Fraction	0.005	g	-	38	< 0.005	-
Analysed Material	0.1	%	-	74	100	-
Extraneous Material	0.1	%	-	26	< 0.1	-
Foreign Materials - ENM						
Initial Weight	0.01	kg	-	-	-	2.9
Foreign Material - Type I						
Metal*	0.1	%	-	-	-	< 0.1
Glass*	0.1	%	-	-	-	< 0.1
Asphalt*	0.1	%	-	-	-	< 0.1
Stone*	0.1	%	-	-	-	4.7
Ceramic and slag (other than blast furnace slag)*	0.1	%	-	-	-	< 0.1
Foreign Material - Type II						
Plaster*	0.1	%	-	-	-	< 0.1
Clay lumps and other friable material*	0.1	%	-	-	-	95
Foreign Material - Type III						
Rubber*	0.05	%	-	-	-	< 0.05
Plastic*	0.05	%	-	-	-	< 0.05
Bitumen*	0.05	%	-	-	-	< 0.05
Paper*	0.05	%	-	-	-	< 0.05
Cloth*	0.05	%	-	-	-	< 0.05
Paint*	0.05	%	-	-	-	< 0.05
Wood*	0.05	%	-	-	-	< 0.05
Vegetable matter*	0.05	%	-	-	-	< 0.05

Client Sample ID			BH5-1	BH5-2	BH5-C	BH6-1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037097	S24-Ja0037098	S24-Ja0037099	S24-Ja0037100
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	< 20	-	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	-	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	-	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	-	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	-	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	-	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	-	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	-	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	-	< 100

Client Sample ID			BH5-1	BH5-2	BH5-C	BH6-1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037097	S24-Ja0037098	S24-Ja0037099	S24-Ja0037100
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	88	85	-	78
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	100	100	-	98
p-Terphenyl-d14 (surr.)	1	%	112	123	-	119
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	130	150	-	200
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	4.2	4.3	-	4.2
Heavy Metals						
Arsenic	2	mg/kg	4.0	5.1	-	16
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
Chromium	5	mg/kg	11	15	-	16
Copper	5	mg/kg	< 5	< 5	-	< 5
Lead	5	mg/kg	< 5	< 5	-	6.0
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Nickel	5	mg/kg	< 5	< 5	-	< 5
Zinc	5	mg/kg	< 5	< 5	-	7.7
Sample Properties						
% Moisture	1	%	9.4	9.9	-	11
Foreign Materials - ENM						
Initial Weight	0.01	kg	-	-	2.6	-

Client Sample ID			BH5-1	BH5-2	BH5-C	BH6-1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037097	S24-Ja0037098	S24-Ja0037099	S24-Ja0037100
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Foreign Material - Type I						
Metal*	0.1	%	-	-	< 0.1	-
Glass*	0.1	%	-	-	< 0.1	-
Asphalt*	0.1	%	-	-	< 0.1	-
Stone*	0.1	%	-	-	4.8	-
Ceramic and slag (other than blast furnace slag)*	0.1	%	-	-	< 0.1	-
Foreign Material - Type II						
Plaster*	0.1	%	-	-	< 0.1	-
Clay lumps and other friable material*	0.1	%	-	-	95	-
Foreign Material - Type III						
Rubber*	0.05	%	-	-	< 0.05	-
Plastic*	0.05	%	-	-	< 0.05	-
Bitumen*	0.05	%	-	-	< 0.05	-
Paper*	0.05	%	-	-	< 0.05	-
Cloth*	0.05	%	-	-	< 0.05	-
Paint*	0.05	%	-	-	< 0.05	-
Wood*	0.05	%	-	-	< 0.05	-
Vegetable matter*	0.05	%	-	-	< 0.05	-

Client Sample ID			BH6-2	BH6-C	BH7-1	BH7-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037101	S24-Ja0037102	S24-Ja0037103	S24-Ja0037104
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	20	mg/kg	< 20	-	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	-	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	-	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	-	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	-	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	-	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	-	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	-	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	-	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	< 100	< 100
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	92	-	86	89
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5

Client Sample ID			BH6-2	BH6-C	BH7-1	BH7-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037101	S24-Ja0037102	S24-Ja0037103	S24-Ja0037104
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	98	-	100	99
p-Terphenyl-d14 (surr.)	1	%	104	-	114	107
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	160	-	210	190
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	4.1	-	4.2	4.6
Heavy Metals						
Arsenic	2	mg/kg	14	-	12	9.6
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	< 0.4
Chromium	5	mg/kg	23	-	22	23
Copper	5	mg/kg	< 5	-	< 5	< 5
Lead	5	mg/kg	6.5	-	5.1	6.5
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	-	< 5	< 5
Zinc	5	mg/kg	6.6	-	8.7	8.4
Sample Properties						
% Moisture	1	%	16	-	16	13
Foreign Materials - ENM						
Initial Weight	0.01	kg	-	2.8	-	-
Foreign Material - Type I						
Metal*	0.1	%	-	< 0.1	-	-
Glass*	0.1	%	-	< 0.1	-	-
Asphalt*	0.1	%	-	< 0.1	-	-
Stone*	0.1	%	-	4.0	-	-
Ceramic and slag (other than blast furnace slag)*	0.1	%	-	< 0.1	-	-
Foreign Material - Type II						
Plaster*	0.1	%	-	< 0.1	-	-
Clay lumps and other friable material*	0.1	%	-	96	-	-

Client Sample ID			BH6-2	BH6-C	BH7-1	BH7-2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037101	S24-Ja0037102	S24-Ja0037103	S24-Ja0037104
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit				
Foreign Material - Type III						
Rubber*	0.05	%	-	< 0.05	-	-
Plastic*	0.05	%	-	< 0.05	-	-
Bitumen*	0.05	%	-	< 0.05	-	-
Paper*	0.05	%	-	< 0.05	-	-
Cloth*	0.05	%	-	< 0.05	-	-
Paint*	0.05	%	-	< 0.05	-	-
Wood*	0.05	%	-	< 0.05	-	-
Vegetable matter*	0.05	%	-	< 0.05	-	-

Client Sample ID			BH7-ASS1-1.5	BH7-ASS2-2.5	BH7-C
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037105	S24-Ja0037106	S24-Ja0037107
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit			
Sample Properties					
% Moisture	1	%	16	17	-
Actual Acidity (NLM-3.2)					
pH-KCL (NLM-3.1)	0.1	pH Units	4.3	4.3	-
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	53	55	-
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.084	0.088	-
Potential Acidity - Chromium Reducible Sulfur					
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	0.005	< 0.005	-
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	3.2	< 3	-
Extractable Sulfur					
Sulfur - KCl Extractable	0.005	% S	0.010	0.011	-
HCl Extractable Sulfur	0.005	% S	0.012	0.015	-
Retained Acidity (S-NAS)					
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	< 0.005	0.009	-
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	< 0.005	0.007	-
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	< 2	4.3	-
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	-
Acid Neutralising Capacity (ANCbt)					
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	-
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	-
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	-
ANC Fineness Factor		factor	1.5	1.5	-
Net Acidity (Including ANC)					
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.09	0.10	-
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	56	59	-
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	4.2	4.4	-
Extraneous Material					
<2mm Fraction	0.005	g	130	110	-
>2mm Fraction	0.005	g	< 0.005	61	-
Analysed Material	0.1	%	100	64	-
Extraneous Material	0.1	%	< 0.1	36	-
Foreign Materials - ENM					
Initial Weight	0.01	kg	-	-	3.4

Client Sample ID			BH7-ASS1-1.5	BH7-ASS2-2.5	BH7-C
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S24-Ja0037105	S24-Ja0037106	S24-Ja0037107
Date Sampled			Jan 18, 2024	Jan 18, 2024	Jan 18, 2024
Test/Reference	LOR	Unit			
Foreign Material - Type I					
Metal*	0.1	%	-	-	< 0.1
Glass*	0.1	%	-	-	< 0.1
Asphalt*	0.1	%	-	-	< 0.1
Stone*	0.1	%	-	-	3.0
Ceramic and slag (other than blast furnace slag)*	0.1	%	-	-	< 0.1
Foreign Material - Type II					
Plaster*	0.1	%	-	-	< 0.1
Clay lumps and other friable material*	0.1	%	-	-	97
Foreign Material - Type III					
Rubber*	0.05	%	-	-	< 0.05
Plastic*	0.05	%	-	-	< 0.05
Bitumen*	0.05	%	-	-	< 0.05
Paper*	0.05	%	-	-	< 0.05
Cloth*	0.05	%	-	-	< 0.05
Paint*	0.05	%	-	-	< 0.05
Wood*	0.05	%	-	-	< 0.05
Vegetable matter*	0.05	%	-	-	< 0.05

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
ENM Exemption Suite -The excavated natural material order 2014 NSW EPA(excluding Foreign Material)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 29, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 29, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 29, 2024	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jan 29, 2024	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polycyclic Aromatic Hydrocarbons	Sydney	Jan 29, 2024	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	Sydney	Jan 29, 2024	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25 °C as rec.)	Sydney	Jan 29, 2024	7 Days
- Method: LTM-GEN-7090 pH by ISE			
Metals M8	Sydney	Jan 29, 2024	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Brisbane	Jan 24, 2024	14 Days
- Method: LTM-GEN-7080 Moisture			
Chromium Reducible Sulfur Suite			
Chromium Suite	Brisbane	Jan 25, 2024	6 Week
- Method: LTM-GEN-7070 Chromium Reducible Sulfur Suite			
Extraneous Material	Brisbane	Jan 25, 2024	6 Week
- Method: LTM-GEN-7050/7070			
Foreign Material - Type I	Sydney	Jan 24, 2024	180 Days
- Method: RMS Method T276			
Foreign Material - Type II	Sydney	Jan 24, 2024	180 Days
- Method: RMS Method T276			
Foreign Material - Type III	Sydney	Jan 24, 2024	180 Days
- Method: RMS Method T276			

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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: ENV Services Pty Ltd
Address: 313 River Street
Ballina
NSW 2478

Project Name: TENNYSON STREET EXTENSION
Project ID: 240004

Order No.:
Report #: 1062185
Phone: 1300 861 325
Fax:

Received: Jan 24, 2024 10:15 AM
Due: Jan 30, 2024
Priority: 3 Day
Contact Name: Ben Pieterse

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Foreign Materials - ENM	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	ENM Exemption Suite - The excavated natural material order 2014 NSW
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	BH1-1	Jan 18, 2024		Soil	S24-Ja0037077				X	X
2	BH1-2	Jan 18, 2024		Soil	S24-Ja0037078				X	X
3	BH1-ASS1-1.5	Jan 18, 2024		Soil	S24-Ja0037079		X	X		
4	BH1-ASS2-2.0	Jan 18, 2024		Soil	S24-Ja0037080		X	X		
5	BH1-C	Jan 18, 2024		Soil	S24-Ja0037081	X				
6	BH2-1	Jan 18, 2024		Soil	S24-Ja0037082				X	X
7	BH2-2	Jan 18, 2024		Soil	S24-Ja0037083				X	X
8	BH2-ASS1-1.0	Jan 18, 2024		Soil	S24-Ja0037084		X	X		
9	BH2-ASS2-1.7	Jan 18, 2024		Soil	S24-Ja0037085		X	X		
10	BH2-C	Jan 18, 2024		Soil	S24-Ja0037086	X				
11	BH3-1	Jan 18, 2024		Soil	S24-Ja0037087				X	X
12	BH3-2	Jan 18, 2024		Soil	S24-Ja0037088				X	X

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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
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+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: ENV Services Pty Ltd
Address: 313 River Street
Ballina
NSW 2478

Project Name: TENNYSON STREET EXTENSION
Project ID: 240004

Order No.:
Report #: 1062185
Phone: 1300 861 325
Fax:

Received: Jan 24, 2024 10:15 AM
Due: Jan 30, 2024
Priority: 3 Day
Contact Name: Ben Pieterse

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Foreign Materials - ENM	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	ENM Exemption Suite - The excavated natural material order 2014 NSW
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	
13	BH3-ASS1-1.5	Jan 18, 2024		Soil	S24-Ja0037089		X	X		
14	BH3-ASS2-2.0	Jan 18, 2024		Soil	S24-Ja0037090		X	X		
15	BH3-C	Jan 18, 2024		Soil	S24-Ja0037091	X				
16	BH4-1	Jan 18, 2024		Soil	S24-Ja0037092				X	X
17	BH4-2	Jan 18, 2024		Soil	S24-Ja0037093				X	X
18	BH4-ASS1-1.0	Jan 18, 2024		Soil	S24-Ja0037094		X	X		
19	BH4-ASS2-1.7	Jan 18, 2024		Soil	S24-Ja0037095		X	X		
20	BH4-C	Jan 18, 2024		Soil	S24-Ja0037096	X				
21	BH5-1	Jan 18, 2024		Soil	S24-Ja0037097				X	X
22	BH5-2	Jan 18, 2024		Soil	S24-Ja0037098				X	X
23	BH5-C	Jan 18, 2024		Soil	S24-Ja0037099	X				
24	BH6-1	Jan 18, 2024		Soil	S24-Ja0037100				X	X
25	BH6-2	Jan 18, 2024		Soil	S24-Ja0037101				X	X
26	BH6-C	Jan 18, 2024		Soil	S24-Ja0037102	X				
27	BH7-1	Jan 18, 2024		Soil	S24-Ja0037103				X	X

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Eurofins Environment Testing Australia Pty Ltd
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Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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Sample Detail						Foreign Materials - ENM	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	ENM Exemption Suite - The excavated natural material order 2014 NSW
Sydney Laboratory - NATA # 1261 Site # 18217						X		X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X	
28	BH7-2	Jan 18, 2024		Soil	S24-Ja0037104				X	X
29	BH7-ASS1-1.5	Jan 18, 2024		Soil	S24-Ja0037105		X	X		
30	BH7-ASS2-2.5	Jan 18, 2024		Soil	S24-Ja0037106		X	X		
31	BH7-C	Jan 18, 2024		Soil	S24-Ja0037107	X				
Test Counts						7	10	24	24	14

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit	**Colour:** Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Conductivity (1:5 aqueous extract at 25 °C as rec.)	uS/cm	< 10			10	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons							
TRH C6-C9	%	110			70-130	Pass	
TRH C10-C14	%	86			70-130	Pass	
TRH C6-C10	%	108			70-130	Pass	
TRH >C10-C16	%	84			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	107			70-130	Pass	
Toluene	%	99			70-130	Pass	
Ethylbenzene	%	96			70-130	Pass	
m&p-Xylenes	%	99			70-130	Pass	
o-Xylene	%	93			70-130	Pass	
Xylenes - Total*	%	97			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	105			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	84			70-130	Pass	
Acenaphthylene	%	83			70-130	Pass	
Anthracene	%	93			70-130	Pass	
Benz(a)anthracene	%	73			70-130	Pass	
Benzo(a)pyrene	%	73			70-130	Pass	
Benzo(b&j)fluoranthene	%	73			70-130	Pass	
Benzo(g.h.i)perylene	%	74			70-130	Pass	
Benzo(k)fluoranthene	%	89			70-130	Pass	
Chrysene	%	88			70-130	Pass	
Dibenz(a.h)anthracene	%	75			70-130	Pass	
Fluoranthene	%	90			70-130	Pass	
Fluorene	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	73			70-130	Pass	
Naphthalene	%	88			70-130	Pass	
Phenanthrene	%	78			70-130	Pass	
Pyrene	%	90			70-130	Pass	
LCS - % Recovery							
Conductivity (1:5 aqueous extract at 25 °C as rec.)	%	102			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	99			80-120	Pass	
Cadmium	%	102			80-120	Pass	
Chromium	%	106			80-120	Pass	
Copper	%	101			80-120	Pass	
Lead	%	96			80-120	Pass	
Mercury	%	105			80-120	Pass	
Nickel	%	108			80-120	Pass	
Zinc	%	105			80-120	Pass	
LCS - % Recovery							
Actual Acidity (NLM-3.2)							
pH-KCL (NLM-3.1)	%	99			80-120	Pass	
Titratable Actual Acidity (NLM-3.2)	%	112			80-120	Pass	
LCS - % Recovery							
Potential Acidity - Chromium Reducible Sulfur							
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)	%	95			80-120	Pass	
LCS - % Recovery							

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Extractable Sulfur									
HCl Extractable Sulfur			%	102			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C10-C14	S24-Ja0035975	NCP	%	81			70-130	Pass	
TRH >C10-C16	S24-Ja0035975	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S24-Ja0029160	NCP	%	92			70-130	Pass	
Acenaphthylene	S24-Ja0029160	NCP	%	86			70-130	Pass	
Anthracene	S24-Ja0029160	NCP	%	92			70-130	Pass	
Benz(a)anthracene	S24-Ja0029160	NCP	%	77			70-130	Pass	
Benzo(a)pyrene	S24-Ja0029160	NCP	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	S24-Ja0029160	NCP	%	71			70-130	Pass	
Benzo(g.h.i)perylene	S24-Ja0029160	NCP	%	78			70-130	Pass	
Benzo(k)fluoranthene	S24-Ja0029160	NCP	%	91			70-130	Pass	
Chrysene	S24-Ja0029160	NCP	%	93			70-130	Pass	
Dibenz(a.h)anthracene	S24-Ja0029160	NCP	%	90			70-130	Pass	
Fluoranthene	S24-Ja0029160	NCP	%	85			70-130	Pass	
Fluorene	S24-Ja0029160	NCP	%	93			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S24-Ja0029160	NCP	%	90			70-130	Pass	
Naphthalene	S24-Ja0029160	NCP	%	93			70-130	Pass	
Phenanthrene	S24-Ja0029160	NCP	%	79			70-130	Pass	
Pyrene	S24-Ja0029160	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S24-Ja0035864	NCP	%	92			75-125	Pass	
Cadmium	S24-Ja0035864	NCP	%	100			75-125	Pass	
Chromium	S24-Ja0035864	NCP	%	100			75-125	Pass	
Copper	S24-Ja0035864	NCP	%	97			75-125	Pass	
Lead	R24-Ja0029705	NCP	%	87			75-125	Pass	
Mercury	S24-Ja0035864	NCP	%	102			75-125	Pass	
Nickel	S24-Ja0035864	NCP	%	105			75-125	Pass	
Zinc	S24-Ja0035864	NCP	%	97			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S24-Ja0037078	CP	%	71			70-130	Pass	
TRH C6-C10	S24-Ja0037078	CP	%	72			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S24-Ja0037078	CP	%	76			70-130	Pass	
Toluene	S24-Ja0037078	CP	%	74			70-130	Pass	
Ethylbenzene	S24-Ja0037078	CP	%	71			70-130	Pass	
m&p-Xylenes	S24-Ja0037078	CP	%	71			70-130	Pass	
o-Xylene	S24-Ja0037078	CP	%	73			70-130	Pass	
Xylenes - Total*	S24-Ja0037078	CP	%	72			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S24-Ja0037078	CP	%	82			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S24-Ja0037101	CP	%	87			70-130	Pass	
TRH C6-C10	S24-Ja0037101	CP	%	85			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	S24-Ja0037101	CP	%	85			70-130	Pass	
Toluene	S24-Ja0037101	CP	%	82			70-130	Pass	
Ethylbenzene	S24-Ja0037101	CP	%	78			70-130	Pass	
m&p-Xylenes	S24-Ja0037101	CP	%	83			70-130	Pass	
o-Xylene	S24-Ja0037101	CP	%	73			70-130	Pass	
Xylenes - Total*	S24-Ja0037101	CP	%	79			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S24-Ja0037101	CP	%	80			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C10-C14	S24-Ja0035863	NCP	mg/kg	82	37	75	30%	Fail	Q15
TRH C15-C28	S24-Ja0035863	NCP	mg/kg	550	240	77	30%	Fail	Q15
TRH C29-C36	S24-Ja0035863	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C10-C16	S24-Ja0035863	NCP	mg/kg	110	< 50	77	30%	Fail	Q15
TRH >C16-C34	S24-Ja0035863	NCP	mg/kg	540	240	75	30%	Fail	Q15
TRH >C34-C40	S24-Ja0035863	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S24-Ja0031861	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	S24-Ja0040720	NCP	uS/cm	70	62	11	30%	Pass	
pH (1:5 Aqueous extract at 25 °C as rec.)	S24-Ja0040704	NCP	pH Units	8.8	8.7	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S24-Ja0040700	NCP	mg/kg	7.7	7.4	3.7	30%	Pass	
Cadmium	S24-Ja0040700	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S24-Ja0040700	NCP	mg/kg	12	13	9.9	30%	Pass	
Copper	S24-Ja0040700	NCP	mg/kg	20	23	14	30%	Pass	
Lead	S24-Ja0040700	NCP	mg/kg	13	15	14	30%	Pass	
Mercury	S24-Ja0040700	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S24-Ja0040700	NCP	mg/kg	9.8	12	17	30%	Pass	
Zinc	S24-Ja0040700	NCP	mg/kg	39	46	17	30%	Pass	

Duplicate									
Actual Acidity (NLM-3.2)				Result 1	Result 2	RPD			
pH-KCL (NLM-3.1)	S24-Ja0037080	CP	pH Units	4.5	4.5	<1	20%	Pass	
Titratable Actual Acidity (NLM-3.2)	S24-Ja0037080	CP	mol H+/t	44	39	12	20%	Pass	
Titratable Actual Acidity (NLM-3.2)	S24-Ja0037080	CP	% pyrite S	0.071	0.063	12	30%	Pass	
Duplicate									
Potential Acidity - Chromium Reducible Sulfur				Result 1	Result 2	RPD			
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)	S24-Ja0037080	CP	% S	< 0.005	< 0.005	<1	20%	Pass	
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	S24-Ja0037080	CP	mol H+/t	< 3	< 3	<1	30%	Pass	
Duplicate									
Extractable Sulfur				Result 1	Result 2	RPD			
Sulfur - KCl Extractable	S24-Ja0037080	CP	% S	0.011	0.011	7.7	30%	Pass	
HCl Extractable Sulfur	S24-Ja0037080	CP	% S	0.015	0.015	2.0	20%	Pass	
Duplicate									
Retained Acidity (S-NAS)				Result 1	Result 2	RPD			
Net Acid soluble sulfur (SNAS) NLM-4.1	S24-Ja0037080	CP	% S	< 0.005	< 0.005	<1	30%	Pass	
Net Acid soluble sulfur (s-SNAS) NLM-4.1	S24-Ja0037080	CP	% S	< 0.005	< 0.005	<1	30%	Pass	
Net Acid soluble sulfur (a-SNAS) NLM-4.1	S24-Ja0037080	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
Duplicate									
Acid Neutralising Capacity (ANCbt)				Result 1	Result 2	RPD			
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	S24-Ja0037080	CP	% CaCO3	N/A	N/A	N/A	20%	Pass	
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)	S24-Ja0037080	CP	% S	N/A	N/A	N/A	30%	Pass	
ANC Fineness Factor	S24-Ja0037080	CP	factor	1.5	1.5	<1	30%	Pass	
Duplicate									
Net Acidity (Including ANC)				Result 1	Result 2	RPD			
s-CRS Suite - Net Acidity - NASSG (including ANC)	S24-Ja0037080	CP	% S	0.07	0.06	12	30%	Pass	
CRS Suite - Net Acidity - NASSG (Including ANC)	S24-Ja0037080	CP	mol H+/t	44	39	12	30%	Pass	
CRS Suite - Liming Rate - NASSG (Including ANC)	S24-Ja0037080	CP	kg CaCO3/t	3.3	3.0	12	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S24-Ja0037090	CP	%	20	18	8.3	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S24-Ja0037100	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10	S24-Ja0037100	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S24-Ja0037100	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S24-Ja0037100	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S24-Ja0037100	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S24-Ja0037100	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S24-Ja0037100	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S24-Ja0037100	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S24-Ja0037100	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m3'
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl if greater than or equal to pH 6.5
S04	Acid Sulfate Soil Samples have a 24 hour holding time unless frozen or dried within that period

Authorised by:

Bonnie Pu	Analytical Services Manager
Jonathon Angell	Senior Analyst-Sample Properties
Jonathon Angell	Senior Analyst-SPOCAS
Mickael Ros	Senior Analyst-Metal
Raymond Siu	Senior Analyst-Volatile
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile
Ryan Phillips	Senior Analyst-Inorganic

Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Attachment 4 – Borelogs

Borehole BH1

PROJECT NUMBER 240004
PROJECT NAME Tennyson Street Extension
CLIENT Planit Consulting
ADDRESS Tennyson Street, Byron Bay NSW 2481
DRILLING METHOD SFA

DRILLING DATE 18/1/24
TOTAL DEPTH 2 m
DIAMETER 50 mm

COORDINATES NA
COORD SYS NA
COMPLETION NA
SURFACE ELEVATION NA
WELL TOC NA

COMMENTS

LOGGED BY JA

Depth (m)	Graphic Log	Material Description	Soil Samples	Additional Observations
0.1		Gravely, sandy, CLAY, high organic matter content		Fill/garden bed material.
0.2				
0.3				
0.4				
0.5		Sandy CLAY, light brown, organic matter, medium plasticity		
0.6				
0.7				
0.8				
0.9				
1		Sandy CLAY, orange, high plasticity, small gravels, moist	BH1-1 BH1-ASS1-1.0	
1.1				
1.2				
1.3				
1.4				
1.5			BH1-2 BH1-ASS2-1.5	
1.6				
1.7				
1.8				
1.9				
2		Termination Depth at: 2 m.		No ASS properties identified.

Disclaimer This bore log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 01 Feb 2024

Borehole BH2

PROJECT NUMBER 240004
PROJECT NAME Tennyson Street Extension
CLIENT Planit Consulting
ADDRESS Tennyson Street, Byron Bay NSW 2481
DRILLING METHOD SFA

DRILLING DATE 18/1/24
TOTAL DEPTH 1.7 m
DIAMETER 50 mm

COORDINATES NA
COORD SYS NA
COMPLETION NA
SURFACE ELEVATION NA
WELL TOC NA

COMMENTS

LOGGED BY JA

Depth (m)	Graphic Log	Material Description	Soil Samples	Additional Observations
0.1		Mulch, organic matter.		Fill/garden bed material.
0.2		Light brown sandy clay, dry, low plasticity.		
0.5		Sandy CLAY, orange/red, high plasticity, small gravels, moist, white mottle	BH2-1	Stones and rock inclusions 10-15 mm.
1			BH2-ASS1-1.0	
1.5			BH2-2	
1.7			ASS2-1.7	
		Termination Depth at: 1.7 m.		

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Borehole BH3

PROJECT NUMBER 240004
PROJECT NAME Tennyson Street Extension
CLIENT Planit Consulting
ADDRESS Tennyson Street, Byron Bay NSW 2481
DRILLING METHOD SFA

DRILLING DATE 18/1/24
TOTAL DEPTH 1.5 m
DIAMETER 50 mm

COORDINATES NA
COORD SYS NA
COMPLETION NA
SURFACE ELEVATION NA
WELL TOC NA

COMMENTS

LOGGED BY JA

Depth (m)	Graphic Log	Material Description	Soil Samples	Additional Observations
0.1		Clay SANDS, orange/grey, loose, dry, gravel inclusions.		
0.2		SAND, grey, mosit, low plasticity, black mottle, OM.		
0.3				
0.4				
0.5			BH3-1	
0.6				
0.7				
0.8				
0.9				
1		SAND, black/grey, increasing moisture, low plasticity.	BH3-ASS1-1.0	
1.1				
1.2			BH3-2	
1.3		SAND, black/grey, low plasticity, wet.		Slight sulfur odour.
1.4				
1.5			BH3-ASS2-1.5	
		Termination Depth at: 1.5 m.		

Disclaimer This bore log is intended for environmental not geotechnical purposes.
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Borehole BH4

PROJECT NUMBER 240004
PROJECT NAME Tennyson Street Extension
CLIENT Planit Consulting
ADDRESS Tennyson Street, Byron Bay NSW 2481
DRILLING METHOD SFA

DRILLING DATE 18/1/24
TOTAL DEPTH 1.5 m
DIAMETER 50 mm

COORDINATES NA
COORD SYS NA
COMPLETION NA
SURFACE ELEVATION NA
WELL TOC NA

COMMENTS

LOGGED BY JA

Depth (m)	Graphic Log	Material Description	Soil Samples	Additional Observations
0.1		Sandy gravely CLAY, light brown, dry, low plasticity, small gravel inclusions.		Rubbish present in surface soils, food wrappings, plastic, clothing.
0.2				
0.3				
0.4				
0.5			BH4-1	
0.6				
0.7		Sandy CLAY, orange, low to medium plasticity, damp		
0.8				
0.9				
1			BH4-ASS1-1.0	
1.1				
1.2			BH4-2	
1.3		Sandy CLAY, medium to high plasticity, medium grained, moist		
1.4				
1.5			BH4-ASS2-1.5	Water encountered at 1.5 m.
		Termination Depth at: 1.5 m.		

Disclaimer This bore log is intended for environmental not geotechnical purposes.
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Borehole BH5

PROJECT NUMBER 240004
PROJECT NAME Tennyson Street Extension
CLIENT Planit Consulting
ADDRESS Tennyson Street, Byron Bay NSW 2481
DRILLING METHOD SFA

DRILLING DATE 18/1/24
TOTAL DEPTH 1 m
DIAMETER 50 mm

COORDINATES NA
COORD SYS NA
COMPLETION NA
SURFACE ELEVATION NA
WELL TOC NA

COMMENTS

LOGGED BY JA

Depth (m)	Graphic Log	Material Description	Soil Samples	Additional Observations
0		Asphalt and gravel road base.		
0.05		Sandy gravely CLAY, light brown, dry, low plasticity, small gravel inclusions.		
0.1				
0.15				
0.2				
0.25				
0.3				
0.35				
0.4				
0.45				
0.5			BH5-1	
0.55				
0.6				
0.65				
0.7		Sandy CLAY, orange, low to medium plasticity, damp		
0.75				
0.8				
0.85				
0.9				
0.95			BH5-2	
1		Termination Depth at: 1 m.		

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Borehole BH6

PROJECT NUMBER 240004
PROJECT NAME Tennyson Street Extension
CLIENT Planit Consulting
ADDRESS Tennyson Street, Byron Bay NSW 2481
DRILLING METHOD SFA

DRILLING DATE 18/1/24
TOTAL DEPTH 1 m
DIAMETER 50 mm

COORDINATES NA
COORD SYS NA
COMPLETION NA
SURFACE ELEVATION NA
WELL TOC NA

COMMENTS

LOGGED BY JA

Depth (m)	Graphic Log	Material Description	Soil Samples	Additional Observations
0		Road base, asphalt and gravel		
0.05		Sandy gravely CLAY, light brown, dry, low plasticity, small gravel inclusions.		
0.1				
0.15				
0.2				
0.25				
0.3				
0.35				
0.4				
0.45				
0.5			BH6-1	
0.55				
0.6				
0.65				
0.7		Sandy CLAY, orange, low to medium plasticity, damp		
0.75				
0.8				
0.85				
0.9				
0.95			BH6-2	
1		Termination Depth at: 1 m.		

Disclaimer This bore log is intended for environmental not geotechnical purposes.

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Borehole BH7

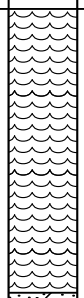
PROJECT NUMBER 240004
PROJECT NAME Tennyson Street Extension
CLIENT Planit Consulting
ADDRESS Tennyson Street, Byron Bay NSW 2481
DRILLING METHOD SFA

DRILLING DATE 18/1/24
TOTAL DEPTH 2.5 m
DIAMETER 50 mm

COORDINATES NA
COORD SYS NA
COMPLETION NA
SURFACE ELEVATION NA
WELL TOC NA

COMMENTS

LOGGED BY JA

Depth (m)	Graphic Log	Material Description	Soil Samples	Additional Observations
0.1		Sandy mulch, organic matter,		Fill material
0.2				
0.3				
0.4				
0.5				
0.6				
0.7		Clay SAND, light brown, loose, dry. low plasticity.		
0.8				
0.9				
1			BH7-1	
1.1				
1.2				
1.3				
1.4				
1.5		Sand CLAY, moist, orange with brown mottle.	BH7-2 BH7-ASS1-1.5	
1.6				
1.7				
1.8				
1.9				
2				No ASS properties identified.
2.1				
2.2				
2.3				
2.4				
2.5			BH7-ASS2-2.5	
2.6		Termination Depth at: 2.5 m.		

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Attachment 5 - ENM *Order* and *Exemption* (2014)

Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014

The excavated natural material order 2014

Introduction

This order, issued by the Environment Protection Authority (EPA) under clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation), imposes the requirements that must be met by suppliers of excavated natural material to which 'the excavated natural material exemption 2014' applies. The requirements in this order apply in relation to the supply of excavated natural material for application to land as engineering fill or for use in earthworks.

1. Waste to which this order applies

1.1. This order applies to excavated natural material. In this order, excavated natural material means naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:

a) been excavated from the ground, and
b) contains at least 98% (by weight) natural material, and
c) does not meet the definition of Virgin Excavated Natural Material in the Act.

Excavated natural material does not include material located in a hotspot; that has been processed; or that contains asbestos, Acid Sulfate Soils (ASS), Potential Acid Sulfate soils (PASS) or sulfidic ores.

2. Persons to whom this order applies

2.1. The requirements in this order apply, as relevant, to any person who supplies excavated natural material, that has been generated, processed or recovered by the person.

2.2. This order does not apply to the supply of excavated natural material to a consumer for land application at a premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

3. Duration

3.1. This order commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

4. Generator requirements

The EPA imposes the following requirements on any generator who supplies excavated natural material.

Sampling requirements

4.1. On or before supplying excavated natural material, the generator must:

4.1.1. Prepare a written sampling plan which includes a description of sample preparation and storage procedures for the excavated natural material.

4.1.2. Undertake sampling and testing of the excavated natural material as required under clauses 4.2, 4.3, and 4.4 below. The sampling must be carried out in accordance with the written sampling plan.

4.2. The generator must undertake sampling and analysis of the material for ASS and PASS, in accordance with the NSW Acid Sulfate Soil Manual, Acid Sulfate Soils Management Advisory Council, 1998 and the updated Laboratory Methods Guidelines version 2.1 – June 2004 where:

4.2.1. the pH measured in the material is below 5, and/or

4.2.2. the review of the applicable Acid Sulfate Soil Risk Maps (published by the former Department of Land and Water Conservation and available at http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm) indicates the potential presence of ASS.

4.3. For stockpiled material, the generator must:

4.3.1. undertake sampling in accordance with Australian Standard 1141.3.1-2012 Methods for sampling and testing aggregates – Sampling – Aggregates (or equivalent);

4.3.2. undertake characterisation sampling by collecting the number of samples listed in Column 2 of Table 1 with respect to the quantity of the waste listed in Column 1 of Table 1 and testing each sample for the chemicals and other attributes listed in Column 1 of Table 4. For the purposes of characterisation sampling the generator must collect:

4.3.2.1. composite samples for attributes 1 to 10 and 18 in Column 1 of Table 4.

4.3.2.2. discrete samples for attributes 11 to 17 in Column 1 of Table 4.

4.3.2.3. The generator must carry out sampling in a way that ensures that the samples taken are representative of the material from the entire stockpile. All parts of the stockpile must be equally accessible for sampling.

4.3.2.4. for stockpiles greater than 4,000 tonnes the number of samples described in Table 1 must be repeated.

4.3.3. store the excavated natural material appropriately until the characterisation test results are validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 4 and the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 1

Sampling of Stockpiled Material		
Column 1	**Column 2**	**Column 3**
Quantity (tonnes)	**Number of samples**	**Validation**
<500	3	Required
500 – 1,000	4	
1,000 – 2,000	5	
2,000 – 3,000	7	
3,000 – 4,000	10	

4.4. For in situ material, the generator must:

4.4.1. undertake sampling by collecting discrete samples. Compositing of samples is not permitted for in-situ materials.

4.4.2. undertake characterisation sampling for the range of chemicals and other attributes listed in Column 1 of Table 4 according to the requirements listed in Columns 1, 2 and 3 of Table 2. When the ground surface is not comprised of soil (e.g. concrete slab), samples must be taken at the depth at which the soil commences.

4.4.3. undertake sampling at depth according to Column 1 of Table 3.

4.4.4. collect additional soil samples (and analyse them for the range of chemicals and other attributes listed in Column 1 of Table 4), at any depth exhibiting discolouration, staining, odour or other indicators of contamination inconsistent with soil samples collected at the depth intervals indicated in Table 3.

4.4.5. segregate and exclude hotspots identified in accordance with Table 2, from material excavated for reuse.

4.4.6. subdivide sites larger than 50,000 m² into smaller areas and sample each area as per Table 2.

4.4.7. store the excavated natural material appropriately until the characterisation test results are validated as compliant with the maximum average concentration or other value listed in Column 2 of Table 4 and the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 2

***In Situ* Sampling at surface**				
Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
Size of *in situ* area (m^2)	**Number of systematic sampling points recommended**	**Distance between two sampling points** (m)	**Diameter of the hot spot that can be detected with 95% confidence** (m)	**Validation**
500	5	10.0	11.8	Required
1000	6	12.9	15.2	
2000	7	16.9	19.9	
3000	9	18.2	21.5	
4000	11	19.1	22.5	
5000	13	19.6	23.1	
6000	15	20.0	23.6	
7000	17	20.3	23.9	
8000	19	20.5	24.2	
9000	20	21.2	25.0	
10,000	21	21.8	25.7	
15,000	25	25.0	28.9	
20,000	30	25.8	30.5	
25,000	35	26.7	31.5	
30,000	40	27.5	32.4	
35,000	45	27.9	32.9	
40,000	50	28.3	33.4	
45,000	52	29.3	34.6	
50,000	55	30.2	35.6	

Table 2 has been taken from NSW EPA 1995, *Contaminated Sites Sampling Design Guidelines*, NSW Environment Protection Authority.

Table 3

***In Situ* Sampling at Depth**	
Column 1	**Column 2**
Sampling Requirements *	**Validation**
1 soil sample at 1.0 m bgl from each surface sampling point followed by 1 soil sample for every metre thereafter. From 1.0 m bgl, sample at the next metre interval until the proposed depth of excavation of the material is reached. If the proposed depth of excavation is between 0.5 to 0.9 m after the last metre interval, sample at the base of the proposed depth of excavation.	Required if the depth of excavation is equal to or greater than 1.0 m bgl

* Refer to Notes for examples

Chemical and other material requirements

4.5. The generator must not supply excavated natural material waste to any person if, in relation to any of the chemical and other attributes of the excavated natural material:

4.5.1. The chemical concentration or other attribute of any sample collected and tested as part of the characterisation of the excavated natural material exceeds the absolute maximum concentration or other value listed in Column 3 of Table 4:

4.5.2. The average concentration or other value of that attribute from the characterisation of the excavated natural material (based on the arithmetic mean) exceeds the maximum average concentration or other value listed in Column 2 of Table 4.

4.6. The absolute maximum concentration or other value of that attribute in any excavated natural material supplied under this order must not exceed the absolute maximum concentration or other value listed in Column 3 of Table 4.

Table 4

Column 1	Column 2	Column 3
Chemicals and other attributes	**Maximum average concentration for characterisation** (mg/kg 'dry weight' unless otherwise specified)	**Absolute maximum concentration** (mg/kg 'dry weight' unless otherwise specified)
1. Mercury	0.5	1
2. Cadmium	0.5	1
3. Lead	50	100
4. Arsenic	20	40
5. Chromium (total)	75	150
6. Copper	100	200
7. Nickel	30	60
8. Zinc	150	300
9. Electrical Conductivity	1.5 dS/m	3 dS/m
10. pH *	5 to 9	4.5 to 10
11. Total Polycyclic Aromatic Hydrocarbons (PAHs)	20	40
12. Benzo(a)pyrene	0.5	1
13. Benzene	NA	0.5
14. Toluene	NA	65
15. Ethyl-benzene	NA	25
16. Xylene	NA	15
17. Total Petroleum Hydrocarbons C_{10}-C_{36}	250	500
18. Rubber, plastic, bitumen, paper, cloth, paint and wood	0.05%	0.10%

* The ranges given for pH are for the minimum and maximum acceptable pH values in the excavated natural material.

Test methods

4.7. The generator must ensure that any testing of samples required by this order is undertaken by analytical laboratories accredited by the National Association of Testing Authorities (NATA), or equivalent.

4.8. The generator must ensure that the chemicals and other attributes (listed in Column 1 of Table 4) in the excavated natural material it supplies are tested in accordance with the test methods specified below or other equivalent analytical methods. Where an equivalent analytical method is used the detection limit must be equal to or less than that nominated for the given method below.

4.8.1. Test methods for measuring the mercury concentration.

4.8.1.1. Analysis using USEPA SW-846 Method 7471B Mercury in solid or semisolid waste (manual cold vapour technique), or an equivalent analytical method with a detection limit < 20% of the stated absolute maximum concentration in Column 3 of Table 2 (i.e. < 0.20 mg/kg dry weight).

4.8.1.2. Report as mg/kg dry weight.

4.8.2. Test methods for measuring chemicals 2 to 8.

4.8.2.1. Sample preparation by digesting using USEPA SW-846 Method 3051A Microwave assisted acid digestion of sediments, sludges, soils, and oils (or an equivalent analytical method).

4.8.2.2. Analysis using USEPA SW-846 Method 6010C Inductively coupled plasma - atomic emission spectrometry, or an equivalent analytical method with a detection limit < 10% of the stated absolute maximum concentration in Column 3 of Table 2, (e.g. 10 mg/kg dry weight for lead).

4.8.2.3. Report as mg/kg dry weight.

4.8.3. Test methods for measuring electrical conductivity and pH.

4.8.3.1. Sample preparation by mixing 1 part excavated natural material with 5 parts distilled water.

4.8.3.2. Analysis using Method 103 (pH) and 104 (Electrical Conductivity) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).

4.8.3.3. Report electrical conductivity in deciSiemens per metre (dS/m).

4.8.4. Test method for measuring Polynuclear Aromatic Hydrocarbons (PAHs) and benzo(a)pyrene.

4.8.4.1. Analysis using USEPA SW-846 Method 8100 Polynuclear Aromatic Hydrocarbons (or an equivalent analytical method).

4.8.4.2. Calculate the sum of all 16 PAHs for total PAHs.

4.8.4.3. Report total PAHs as mg/kg dry weight.

4.8.4.4. Report benzo(a)pyrene as mg/kg.

4.8.5. Test method for measuring benzene, toluene, ethylbenzene and xylenes (BTEX).

4.8.5.1. Method 501 (Volatile Alkanes and Monocyclic Aromatic Hydrocarbons) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).

4.8.5.2. Report BTEX as mg/kg.

4.8.6. Test method for measuring Total Petroleum Hydrocarbons (TPH).

4.8.6.1. Method 506 (Petroleum Hydrocarbons) in Schedule B (3): Guideline on Laboratory Analysis of Potentially Contaminated Soils, National Environment Protection (Assessment of Site Contamination) Measure 1999 (or an equivalent analytical method).

4.8.6.2. Report as mg/kg dry weight.

4.8.7. Test method for measuring rubber, plastic, bitumen, paper, cloth, paint and wood.

4.8.7.1. NSW Roads & Traffic Authority Test Method T276 Foreign Materials Content of Recycled Crushed Concrete (or an equivalent method).

4.8.7.2. Report as percent.

Notification

4.9. On or before each transaction, the generator must provide the following to each person to whom the generator supplies the excavated natural material:

- a written statement of compliance certifying that all the requirements set out in this order have been met;
- a copy of the excavated natural material exemption, or a link to the EPA website where the excavated natural material exemption can be found; and
- a copy of the excavated natural material order, or a link to the EPA website where the excavated natural material order can be found.

Record keeping and reporting

4.10. The generator must keep a written record of the following for a period of six years:

- the sampling plan required to be prepared under clause 4.1.1;
- all characterisation sampling results in relation to the excavated natural material supplied;
- the volume of detected hotspot material and the location;
- the quantity of the excavated natural material supplied; and
- the name and address of each person to whom the generator supplied the excavated natural material.

4.11. The generator must provide, on request, the characterisation and sampling results for that excavated natural material supplied to the consumer of the excavated natural material.

5. Definitions

In this order:

application or apply to land means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

Bgl means below ground level, referring to soil at depth beneath the ground surface.

composite sample means a sample that combines five discrete sub-samples of equal size into a single sample for the purpose of analysis.

consumer means a person who applies, or intends to apply excavated natural material to land.

discrete sample means a sample collected and analysed individually that will not be composited.

generator means a person who generates excavated natural material for supply to a consumer.

hotspot means a cylindrical volume which extends through the soil profile from the ground surface to the proposed depth of excavation, where the level of any contaminant listed in Column 1 of Table 2 is greater than the absolute maximum concentration in Column 3 of Table 2.

***in situ* material** means material that exists on or below the ground level. It does not include stockpiled material.

***in situ* sampling** means sampling undertaken on *in situ* material.

N/A means not applicable.

stockpiled material means material that has been excavated from the ground and temporarily stored on the ground prior to use.

systematic sampling means sampling at points that are selected at even intervals and are statistically unbiased.

transaction means:

- in the case of a one-off supply, the supply of a batch, truckload or stockpile of excavated natural material that is not repeated.
- in the case where the supplier has an arrangement with the recipient for more than one supply of excavated natural material, the first supply of excavated natural material as required under the arrangement.

Manager Waste Strategy and Innovation

Environment Protection Authority

(by delegation)

Notes

The EPA may amend or revoke this order at any time. It is the responsibility of each of the generator and processor to ensure it complies with all relevant requirements of the most current order. The current version of this order will be available on ' www.epa.nsw.gov.au

In gazetting or otherwise issuing this order, the EPA is not in any way endorsing the supply or use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this order are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this order nor the accompanying exemption guarantee that the environment, human health or agriculture will not be harmed.

Any person or entity which supplies excavated natural material should assess whether the material is fit for the purpose the material is proposed to be used for, and whether this use may cause harm. The supplier may need to seek expert engineering or technical advice.

Regardless of any exemption or order provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The supply of excavated natural material remains subject to other relevant environmental regulations in the POEO Act and Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of this order, is guilty of an offence and subject to prosecution.

This order does not alter the requirements of any other relevant legislation that must be met in supplying this material, including for example, the need to prepare a Safety Data Sheet. Failure to comply with the conditions of this order constitutes an offence under clause 93 of the Waste Regulation.

Examples

In situ sampling at depth

Example 1.

If the proposed depth of ENM excavation is between 1 m bgl and 1.4 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- No further depth sampling after 1 m bgl, unless required under section 4.4.4.

Example 2.

If the proposed depth of ENM excavation is at 1.75 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- 1 sample at 1.75 m bgl.
- No further depth sampling after 1.75 m bgl, unless required under section 4.4.4.

Example 3.

If the proposed depth of ENM excavation is at 2.25 m bgl, then:

- 1 sample on surface (as per the requirements of Table 2).
- 1 sample at 1 m bgl.
- 1 sample at 2 m bgl.
- No further depth sampling after 2 m bgl, unless required under section 4.4.4.

Appendix F – Aboriginal Cultural Heritage

Sean Cochran

From: Strzina, Daniel <dstrzina@byron.nsw.gov.au>
Sent: Monday, 28 November 2022 9:08 AM
To: 'Brent Emmons'; Sites
Cc: Cultural Heritage; Provis, Joshua; Wakefield, Luke; Warner, Phil
Subject: RE: Gilmore Crescent Upgrade - Concept Design Site Walk

Brent and Maurice,

Thank you for the considerate replies and agreement on how best to proceed.

Council and Planit will be in touch as we proceed through to detailed design and approach construction to ensure that there is plenty of notice prior to finalising the design and undertaking the works.

Kind regards,

Daniel Strzina | Project Officer | BYRON SHIRE COUNCIL
P: +61 2 6626 7241 | E: dstrzina@byron.nsw.gov.au
Bundjalung Country, PO Box 219, Mullumbimby NSW 2482 | www.byron.nsw.gov.au
Find us on Facebook www.facebook.com/byronshire.council

Byron Shire Council acknowledges the Traditional Owners of this land, the Arakwal people, the Minjungbal people and the Widjabul people of the Bundjalung Nation, and pays our respects to Elders past and present.

Emails from Byron Shire Council may contain confidential and/or privileged information. Please consider the context in which this email has been sent to you, the email's content, and whether it can be disclosed to a third party.

From: Brent Emmons <brent@arakwal.com.au>
Sent: Thursday, 24 November 2022 4:07 PM
To: Sites <sites@tblalc.com>
Cc: Strzina, Daniel <dstrzina@byron.nsw.gov.au>; Cultural Heritage <culturalheritage@tblalc.com>
Subject: Re: Gilmore Crescent Upgrade - Concept Design Site Walk

Hi All
I am in agreement with Maurice's statement and an ACH report is not needed.
Arakwal will prefer to have a CH monitor onsite throughout the grounds work process.
Please keep everyone informed as this project progresses.
Regards
Brent

On Thu, Nov 24, 2022 at 2:34 PM Sites <sites@tblalc.com> wrote:

> Hello Daniel (Josh)
>
> Sorry for delayed reply. We've been preoccupied with field work.
>
> I don't think a detailed ACH report is necessary for this project.

During the walkover of the area covered by the concept design, no ACH Objects were observed. The area was, according to reports, sand mined in the past.

There are however a number of known Aboriginal sites in the surrounding geographical area (five AHIMS registered sites within a one-kilometre radius) so it's obviously reasonable to infer that the area was traversed and used by Aboriginal people.

The fact that no ACH was observed during the walkover and the report that project area has been 'disturbed' by sand mining, do not preclude the possibility of encountering ACH Objects during the course of the works, particularly in the relatively less disturbed areas. Sand mining did not necessarily remove all ACH Objects.

We recommend that Byron Shire proceed with caution and that the work crew should be formally apprised, prior to commencement, of the possibility of encountering (even suspected) ACH and the procedures that should be implemented in these circumstances (i.e.; stop work and notify us in the first instance. We will notify the State Government authorities if necessary).

In our opinion it is appropriate for cultural heritage monitors to be in attendance, at least during the early stages of the works, especially excavations in the vegetated parts of the project area. Sand mining did not necessarily remove all ACH Objects. In particular, there are some earth mounds, which are possible mullock heaps remaining after sand mining, which could potentially contain a concentration of ACH artefacts. Any excavation of these mounds should be monitored.

Kind regards
Maurice Gannon
Conservation Planning Officer
Cultural Heritage Unit
Tweed Byron Local Aboriginal Land Council
m: 0407 643 349

From: Strzina, Daniel <dstrzina@byron.nsw.gov.au>
Sent: Thursday, 17 November 2022 4:17 PM
To: Sites <sites@tblalc.com>; 'brent@arakwal.com.au' <brent@arakwal.com.au>
Cc: 'Luke Wakefield' <LukeW@planitconsulting.com.au>; Provis, Joshua <jprovis@byron.nsw.gov.au>
Subject: FW: Gilmore Crescent Upgrade - Concept Design Site Walk

Hi Maurice and Brent,

Following the walkthrough of Gilmore Crescent on Wednesday 9 November last week, could you please advise:

- whether there are any known sites of current or historical significance that require a change of the concept design,
- whether a full ACH Report is needed for this project, and/or
- what controls are recommended to be implemented during excavation works in this area.

Thanks and best regards,

Daniel Strzina | Project Officer | BYRON SHIRE COUNCIL

P: +61 2 6626 7241 | E: dstrzina@byron.nsw.gov.au
Bundjalung Country, PO Box 219, Mullumbimby NSW 2482 | www.byron.nsw.gov.au
Find us on Facebook www.facebook.com/byronshire.council

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From: Strzina, Daniel <dstrzina@byron.nsw.gov.au>
Sent: Monday, 24 October 2022 1:23 PM
To: 'Sites' <sites@tblalc.com>; 'brent@arakwal.com.au' <brent@arakwal.com.au>; 'info@arakwal.com.au' <info@arakwal.com.au>
Cc: Luke Wakefield <LukeW@planitconsulting.com.au>; McGarry, Claire <cmcgarry@byron.nsw.gov.au>; Appo, Robert <rappo@byron.nsw.gov.au>
Subject: RE: Gilmore Crescent Upgrade - Concept Design Site Walk

Hi Maurice,

Thank you for getting back to my initial email. Just noting that I got the Arakwal office email wrong in the first one I sent out. I'm pretty sure I have it right this time.

Could I suggest then that we try for the **morning of Tuesday 8 November or Thursday 10 November?**

Rita & Charmaine,

Would either of these dates suit? Or would you like to go through the project together before the walkthrough?

Happy to accommodate, just let me know how I can help.

Kind regards,

Daniel Strzina | Project Officer | BYRON SHIRE COUNCIL

P: +61 2 6626 7241 | E: dstrzina@byron.nsw.gov.au
Bundjalung Country, PO Box 219, Mullumbimby NSW 2482 | www.byron.nsw.gov.au
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From: Sites <sites@tblalc.com>
Sent: Monday, 24 October 2022 12:57 PM
To: Strzina, Daniel <dstrzina@byron.nsw.gov.au>; 'brent@arakwal.com.au' <brent@arakwal.com.au>; 'admin@arakwal.com.au' <admin@arakwal.com.au>
Cc: Luke Wakefield <LukeW@planitconsulting.com.au>; McGarry, Claire <cmcgarry@byron.nsw.gov.au>; Appo, Robert <rappo@byron.nsw.gov.au>
Subject: RE: Gilmore Crescent Upgrade - Concept Design Site Walk

Hi Daniel

Currently, we are available Wednesday and Thursday of this week however we're currently rescheduling two other clients - so one, and probably both, of these days are going to be booked on other jobs. Warren is on leave the following week and we have a large property development kicking-off in the Tweed so I am going to be fully committed for the week commencing 31 October.

We then have monitoring of the dune stabilisation works on Main and Clarkes beaches during the following fortnight. I think it may be feasible to try to schedule the walkover during this fortnight (i.e.; 7th to 18th November) i.e.; when we might all agree to a brief 'break' in the dune stabilisation project.

Alternatively, after 23 November is doable.

Kind regards

Maurice

P: 07 5536 1926 **M:** 0407 643 349

From: Strzina, Daniel <dstrzina@byron.nsw.gov.au>
Sent: Friday, 21 October 2022 10:09 AM
To: 'brent@arakwal.com.au' <brent@arakwal.com.au>; 'admin@arakwal.com.au' <admin@arakwal.com.au>; Sites <sites@tblalc.com>
Cc: Luke Wakefield <LukeW@planitconsulting.com.au>; McGarry, Claire <cmcgarry@byron.nsw.gov.au>; Appo, Robert <rappo@byron.nsw.gov.au>
Subject: Gilmore Crescent Upgrade - Concept Design Site Walk

Good morning Brent, Rita, Charmaine and Maurice,

We would like to invite you to walk through a project we're currently designing to consult with us on Aboriginal Cultural Heritage in the area.

The project is the upgrade of Gilmore Crescent in Byron Bay, which includes installation of a shared path that will connect Tennyson St shared path through to the beach-front shared path. As part of the upgrade, we would like to fix some of the erosion and drainage issues along the road, as well as realign the road for potential future connection through to Tennyson St and formalise some of the informal parking in the area.

I have attached concept plans for you to review and would be happy to further explain the project if you like. Feel free to give me a call, my mobile is 0405 570 910.

The purpose of the site walk would be to:

- Let all parties know about the works being planned
- Seek feedback on the concept design
- Identify any sites or items of ACH significance that we would need to be aware of during design and construction
- Identify whether an ACH Inspection Report is necessary
- Identify what controls might be needed in terms of ACH monitoring during construction

Could you please let me know when suits you to attend? Would a Wednesday or Thursday morning be suitable next week or the week after?

Thank you and all the best,

Daniel Strzina | Project Officer | BYRON SHIRE COUNCIL

P: +61 2 6626 7241 | E: dstrzina@byron.nsw.gov.au
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--

Brent Emmons
General Manager
Bundjalung of Byron Bay Aboriginal Corporation- Arakwal
Phone- 02 66858746

I would like to acknowledge the Arakwal Bumberlin people of Bundjalung Nation who are the Traditional Custodians of this land which we live, work, and stand on.

I acknowledge their continuing living culture, connection to land, waters and community; I ask that you help look after and respect country.

I acknowledge and extend my respect to Elders both past and present and upcoming future leaders.

Appendix G – NSW SES Response

Our Ref: ID ID2259
Your Ref: J7572

22 January 2024

Sean Cochran
Planit Consulting
PO Box 161
Lennox Head NSW 2478

email: sean@planitconsulting.com.au

CC: michael.stubbs@one.ses.nsw.gov.au

Dear Sean,

Notification under section 2.13 of the State Environmental Planning Policy (Transport and Infrastructure) 2021 in relation to the proposed Gilmore Crescent Extension

Thank you for the notification under section 2.13 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* in relation to the proposed upgrade of Gilmore Crescent Extension, Byron Bay. It is understood the proposed works will extend Gilmore Crescent through to Tennyson Street including provision of additional parking, shared pathway and roadside infrastructure. The proposal includes works to:

- Remove kerbs, install wheel stops, install lockable gate, install retractable bollards, and interface with pavement including removal of concrete strip.
- Creation of perpendicular parking spaces.
- Creation of shared pathway.
- Remove redundant pavement area and replace with seeded topsoil.

The NSW State Emergency Service (NSW SES) is the agency responsible for dealing with floods, storms and tsunami in NSW. This role includes, planning for, responding to and coordinating the initial recovery from floods. As such, the NSW SES has an interest in the public safety aspects of the development of flood prone land, particularly the potential for changes to land use to either exacerbate existing flood risk or create new flood risk for communities in NSW.

The NSW SES has reviewed the proposed upgrade and the flood risk information available to the NSW SES (e.g. Byron Bay Local Flood Plan, Belongil Creek Floodplain Risk Management Study and Plan etc.) which reveal that the area of the site is affected by flooding. The Belongil Creek Floodplain Risk Management Study and Plan 2015 notes that there are three major types of flood risk in the Belongil Catchment consisting of storm tide inundation, Belongil Creek flooding and local catchment stormwater runoff[1].

The Belongil Creek Floodplain Risk Management Study demonstrates that flooding around the site area starts at a 10% Annual Exceedance Probability (AEP) flood[2]. The study indicates that

[1] BMT WBM Pty Ltd on behalf of Byron Shire Council, *Belongil Creek Floodplain Risk Management Study and Plan 2015* p.3
[2] Ibid Figure 3.3

STATE HEADQUARTERS
93 - 99 Burelli Street, Wollongong 2500
PO Box 6126, Wollongong NSW 2500
P (02) 4251 6111
F (02) 4251 6190
www.ses.nsw.gov.au
ABN: 88 712 649 015

during a 1% AEP flood, areas of the site will be subject to inundation up to 0.5metres but considered to be a low flood hazard[3]. The site is also in a tsunami evacuation zone. The NSW SES has attended a number of incidents in the area in response to flooding. At the Gilmore Crescent end of the site there is the possibility of egress to safety during a flood, however the Tennyson Street end of the site becomes surrounded by waters during a flood and potentially overtopped entirely. The NSW SES note that there a number of childcare facility and schools on both Gilmore Crescent and Tennyson Street and that during a flood, caregivers will attempt to access these roads to collect children which may result in increased congestion and traffic disruption due to the site works facilities and construction vehicles.

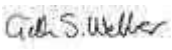
Based on this review, the NSW SES provides the following advice:

- **Consider** the impact of flooding on the infrastructure up to and including the probable Maximum flood (PMF) and including people using the roads.
- **Pursue**, if relevant, site design and stormwater management that minimises any risk to the community.
- **Ensure** workers and people using the site during and after the upgrades are aware of the flood risk, for example by using signage.
- **During** site works, check the Bureau of Meteorology website prior to start of the workday for any Flood Warnings, and consider closing the worksite prior to the start of the working day if there is a risk of flooding.
- **Ensure** that all facilities and equipment including any material temporarily stored in any laydown site is appropriately secured during a weather event.
- **Consider** how the location of any site vehicles and infrastructure, including any installed temporary traffic controls, may affect the flow of traffic during a flood event.

In addition, if the construction phase of the upgrades causes disruption to the operation of local roads, this may impact the ability for emergency vehicles to use these routes. The NSW SES requests that notification be provided where there are likely to be significant delays in the operation of the roads affected by the upgrades.

Please feel free to contact Suede Stanton-Drudy via email at rra@ses.nsw.gov.au should you wish to discuss any of the matters raised in this correspondence. The NSW SES would also be interested in receiving future correspondence regarding the outcome of this referral via this email address.

Yours sincerely



Gillian Webber
Coordinator Emergency Risk Management - Regional
NSW State Emergency Service

[3] Ibid Figure 9.4

Appendix H. **Byron Shire Council's Unexpected Finds and Stop Work Protocols**

BYRON SHIRE COUNCIL

Unexpected Finds Protocols

Human Remains Protocol – Stop Work Procedure

In the event that suspected human remains are encountered during the proposed works:

1. **All activity and work in the area must stop immediately.**
2. The location, including a 20 m curtilage, must be secured, preferably including barrier fencing or signage to avoid further harm
3. **The NSW Police must be contacted immediately.**
4. The relevant Byron Shire Council Project Officer, Manager or Director must be contacted immediately following the police.
5. No further action is to be undertaken until the NSW Police provide written notification to the property owner.
6. If the skeletal remains are identified as Aboriginal, **Council** must contact the following:
   - The Native Title Corporation and/or the Local Aboriginal Lands Council for the Country
   - The DPIE Enviroline on 131 555
7. No works are to continue until Heritage NSW provides written notification to the Proponent.

BYRON SHIRE COUNCIL

Unexpected Finds Protocols

Unexpected Finds Protocol – Stop Work Procedure

The following Unexpected Finds Procedure should be put in place as a minimum.

In the event of the identification of objects, items, artefacts or material during the proposed work:

1. **All activity and work in the area must stop immediately.**

2. A temporary fence is to be erected around the Aboriginal cultural heritage site, with a buffer distance of at least 5 m, but preferably 20m, from the known outer extent of the Aboriginal cultural heritage site.

3. **The relevant Byron Shire Council Project Officer, Manager or Director must be contacted immediately.**

4. **Council** must contact the following:

   - The DPIE Enviroline on 131 555
   - The Native Title Corporation and/or the Local Aboriginal Lands Council for the Country

5. Office of Environment and Heritage or an appropriately qualified archaeological consultant is to be engaged to work with the Native Title Corporation and/or the Local Aboriginal Lands Council for the Country to:

   - identify the material; and
   - if the material is confirmed as an Aboriginal object or archaeological site, facilitate, in collaboration with the traditional owners and appropriate authorities:
     - the recording and assessment of the finds.
     - compliance with any legal requirements and Heritage NSW directions.

PLANIT
CONSULTING