DEVELOPMENT APPLICATION

APPLICATION NUMBER:	PLN-25-307
PROPOSED DEVELOPMENT:	Tourist Operation - Chocolate Experience at Cadbury
LOCATION:	100 Cadbury Road Claremont
APPLICANT:	Era Advisory
ADVERTISING START DATE:	27/03/2026
ADVERTISING EXPIRY DATE:	15/04/2026

Plans and documentation are available for inspection at Council's Offices, located at 374 Main Road, Glenorchy between 8.30 am and 5.00 pm, Monday to Friday (excluding public holidays) and the plans are available on Glenorchy City Council's website (**www.gcc.tas.gov.au**) until **15/04/2026**.

During this time, any person may make representations relating to the applications by letter addressed to the Chief Executive Officer, Glenorchy City Council, PO Box 103, Glenorchy 7010 or by email to gccmail@gcc.tas.gov.au.

Representations must be received by no later than 11.59 pm on **15/04/2026**, or for postal and hand delivered representations, by 5.00 pm on **15/04/2026**.

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Document Set ID: 3598363
Version: 1, Version Date: 25/03/2026

Chocolate Experience at Cadbury

Supporting planning report

era

FINAL | 20 February 2026

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

Era Advisory acknowledge palawa as the Traditional Owners of lutruwita (Tasmania).

They are the original custodians of our land, sky and waters.

We respect their unique ability to care for country and deep spiritual connection to it.

We honour and pay our respect to Elders past and present, whose knowledge and wisdom has and will ensure the continuation of culture and traditional practices.

We acknowledge that their sovereignty has never been ceded.

Always was, always will be.

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Client	Chocolate Experience No. 2
Document version	FINAL - RFI UPDATE V2
Date	28 January 2026
Author	Grace Elliott
Reviewer	Emma Riley
Job number	2425-096

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

Permit overview

Permit application details

Applicant	Era Advisory Pty Ltd obo Chocolate Experience No. 2
Owner	Cadbury Schweppes Pty Ltd (now known as Mondelēz Australia)
Address	100 Cadbury Road, Claremont, Tasmania
Lot description	Folio of the Register 139355, Lot 2 and including the adjoining River Derwent (Timtumili minanya) and Cadbury Road.
Description of Project	Use and development for a visitor experience associated with the Cadbury chocolate factory including new jetty, and new pedestrian and access infrastructure.

Relevant Planning Provisions

Applicable planning scheme	Tasmanian Planning Scheme - Glenorchy
Zone(s)	General Industrial, Light Industrial and Environmental Management
Codes	Parking and Sustainable Transport Code Road and Railway Assets Code Local Historic Heritage Code Natural Assets Code Coastal Inundation Hazard Code Flood-Prone Areas Hazard Code Potentially Contaminated Land Code Landslip Hazard Code
Specific Area Plan	Cadbury Visitor Experience Specific Area Plan
Discretions	· Use discretion (Tourist Operation, General Retail and Hire, Food Services and Community Meeting and Entertainment use classes). **Cadbury Visitor Experience Specific Area Plan** · Clause GLE-S15.7.1 Siting of buildings, structures and landscape elements **Light Industrial Zone** · Clause 18.3.2 Discretionary use **General Industrial Zone** · Clause 19.3.2 Discretionary use **Environmental Management Zone**

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- Clause 23.4.1 Discretionary use
- Clause 23.4.2 (A1/P1) Building height, setback and siting
- Clause 23.4.2 (A2/P2) Building height, setback and siting
- Clause 23.4.4 Vegetation management

Parking and Sustainable Transport Code

- Clause C2.5.1 Car parking numbers
- Clause C2.5.3 Motorcycle parking numbers

Road and Railway Assets Code

- Clause C3.5.1 Traffic generation at a vehicle crossing, level crossing or new junctions

Local Historic Heritage Code

- Clause C2.6.2 Site coverage
- Clause C2.6.3 Height and bulk of buildings
- Clause C2.6.9 Driveways and parking for non-residential purposes
- Clause C2.6.10 Removal, destruction or lopping of trees, or removal of vegetation, that is specifically part of a local heritage place.

Natural Assets Code

- Clause C7.6.1 (A1/P1) Buildings and works within a waterway and coastal protection area or a future coastal refugia area
- Clause C7.6.1 (A2/P2) Buildings and works within a waterway and coastal protection area or a future coastal refugia area
- Clause C7.6.1 (A3/P3) Buildings and works within a waterway and coastal protection area or a future coastal refugia area
- Clause C7.6.2 Clearance within a priority vegetation area

Coastal Inundation Hazard Code

- Clause C11.5.1 Uses within a high coastal inundation hazard band
- Clause C11.5.2 Uses located within a non-urban zone and within a medium coastal inundation hazard band
- Clause C11.6.1 Buildings and works, excluding coastal protection works, within a coastal inundation hazard area

Flood Prone Areas Hazard Code

- Clause C12.6.1 Buildings and works within a flood-prone hazard area

Potentially Contaminated Land Code

- Clause C14.6.1 Excavation works, excluding land subject to the Macquarie Point Development Corporation Act 2012

Landslip Hazard Code

- Clause C15.6.1 Building and works within a landslip hazard area

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1 Introduction

1.1 Purpose

Era Advisory has been engaged on behalf of Chocolate Experience No. 2 (a trading company established by Simon Currant and Associates and partner investors) to provide planning services for a new visitor experience, located at 100 Cadbury Road, Claremont (the chocolate experience). The proposed chocolate experience will provide a contemporary re-imagining of the previously popular visitor experience at the Cadbury chocolate factory.

The report provides a detailed description of the Project and the site and includes an assessment of the proposed use and development against the relevant provisions of the *Tasmanian Planning Scheme – Glenorchy*.

1.2 Enquiries

Enquiries relating to this planning application should be directed to:

Emma Riley
Managing Director
Era Advisory
Email: emma@era-advisory.com.au
Mobile: 0409 787 715

1.3 Planning authority

The relevant planning authority is Glenorchy City Council (Council)

1.4 Title documentation

The subject site (Figure 1) is known as 100 Cadbury Road, Claremont. It also includes the adjoining Timtumili minanya/River Derwent and the Cadbury Road reservation. Land comprising the subject site is detailed in Table 1.

Title documentation is provided separately to this report. Landowner consent relevant to works in the Timtumili minanya/River Derwent and Cadbury Road reservation is also provided separately.

Table 1 Certificate of Title details of all lots associated with the proposed development

No.	Address	PID	Title reference	Land owner
1	'Cadbury Factory', 100 Cadbury Road, Claremont	2245343	139355/2	Mondelēz Australia (formerly known as Cadbury Schweppes Pty Ltd)

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No.	Address	PID	Title reference	Land owner
2	River Derwent (Windermere Bay)	N/A	N/A	The Crown
3	Cadbury Road	N/A	117174/1	Glenorchy City Council

1.5 Background

Mondelēz Australia owns and operates the Cadbury factory at 100 Cadbury Road, Claremont. The factory commenced operations on the site in the 1920s and has continued operations since then. The Cadbury factory has been an iconic industrial use sited on the banks of the Timtumili minanya/River Derwent and has social, cultural and economic significance in the Tasmanian context, including the establishment of 'Cadbury's Estate' on land adjacent to the factory site.

Visitor tours of the factory commenced in 1948, allowing the public to experience the chocolate making process and taste products. Due to food and workplace safety requirements, tours through the factory ceased in 2008. A dedicated visitor centre remained open until 2016, when it was closed due to operational requirements. At its peak the Cadbury factory site attracted 150,000 visitors annually and was one of the most visited sites in Tasmania, providing an important attraction in supporting the Tasmanian visitor economy. The visitor economy is a major industry sector contributing over 6% to the Gross State Product and over 12% of Tasmanian jobs[1].

Chocolate Experience No. 2, through a joint venture with Mondelēz Australia, now proposes to re-establish a visitor experience at the Cadbury factory site. The re-imagined experience will leverage off the existing factory, by providing for a new boutique premium chocolate manufacturing line as well as a broader range of chocolate-based experiences. The new facility will enable a tour-like experience, but in a manner that maintains Mondelēz's operational requirements and separation between industrial and visitor experience areas.

The Project aims to deliver a unique Tasmanian chocolate experience, described by the proponent as:

> *The chocolate experience will celebrate a century of Cadbury in Tasmania while proudly showcasing the State's finest producers, ingredients, and makers. Built on curiosity, invention, and joy, this is an active sensorial experience that brings the wonder of chocolate to life, inspiring discovery and connection through generosity and hands-on fun for all ages. The experience is an architectural embodiment of chocolate itself – rich, layered, and unforgettable. It is a place where magic is not just seen, but felt, tasted, and experienced in every detail.*
>
> *Highlights include Chocolate Central, the vibrant heart of the experience; the Premium Chocolate Studio, Build Your Own Bar, and Masterclass, where visitors create and indulge in exclusive Tasmanian-flavoured Cadbury chocolates; and the decadent Chocolate Lounge. The Immersive Chocolate Tour brings Cadbury's 100-year Tasmanian heritage to life, through the Cacao Forest, Chocolate Lab, Factory Control Room, Taste Kitchen and Emporium.*

To facilitate the consideration of a new visitor experience, this planning permit application has been preceded by an amendment to the Glenorchy Local Provisions Schedule to insert the Cadbury Visitor

[1] 2030 Tasmanian Visitor Economy.

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Experience Specific Area Plan. This amendment was approved by the Tasmanian Planning Commission on 19 August 2025 and came into effect on 28 August 2025.

1.6 Application documentation

The application comprises the following documentation:

- Application form including landowner notification declaration
- Landowner consent
- Title documentation
- Planning report prepared by Era Advisory (this report)
- Architectural drawing set (prepared by Cumulus Studio)
- DA architectural report including photomontages (prepared by Cumulus Studio)
- Landscape plan (prepared by REALMstudios)
- DA Landscape report (prepared by REALMstudios)
- Jetty plans (prepared by Pitt and Sherry)
- Traffic impact assessment including concept parking plan (prepared by MCG Consult)
- Stormwater management plan (prepared by MCG Consult)
- Concept servicing plan (prepared by Collective Engineering)
- Noise impact assessment (prepared by NVC)
- Heritage impact assessment (prepared by Purcell)
- Terrestrial natural values assessment (prepared by North Barker Ecosystem Services)
- Marine natural values assessment (prepared by Marine Solutions)
- Arborist Assessment (prepared by Arbscape)
- Coastal Erosion Hazard Assessment Report (prepared by Pitt and Sherry)
- Coastal Inundation Hazard Assessment Report (prepared by Pitt and Sherry)
- Environmental Site Assessment (prepared by Pitt and Sherry)
- Slope Stability Report (prepared by Pitt and Sherry)
- Visitor Arrivals Assessment (prepared by Evolve Tourism)

An Aboriginal Heritage Assessment has also been undertaken for the site by Cultural Heritage Management Australia. This report is not included in the development application as it contains sensitive material but has been separately provided to Aboriginal Heritage Tasmania in accordance with their standards and protocols.

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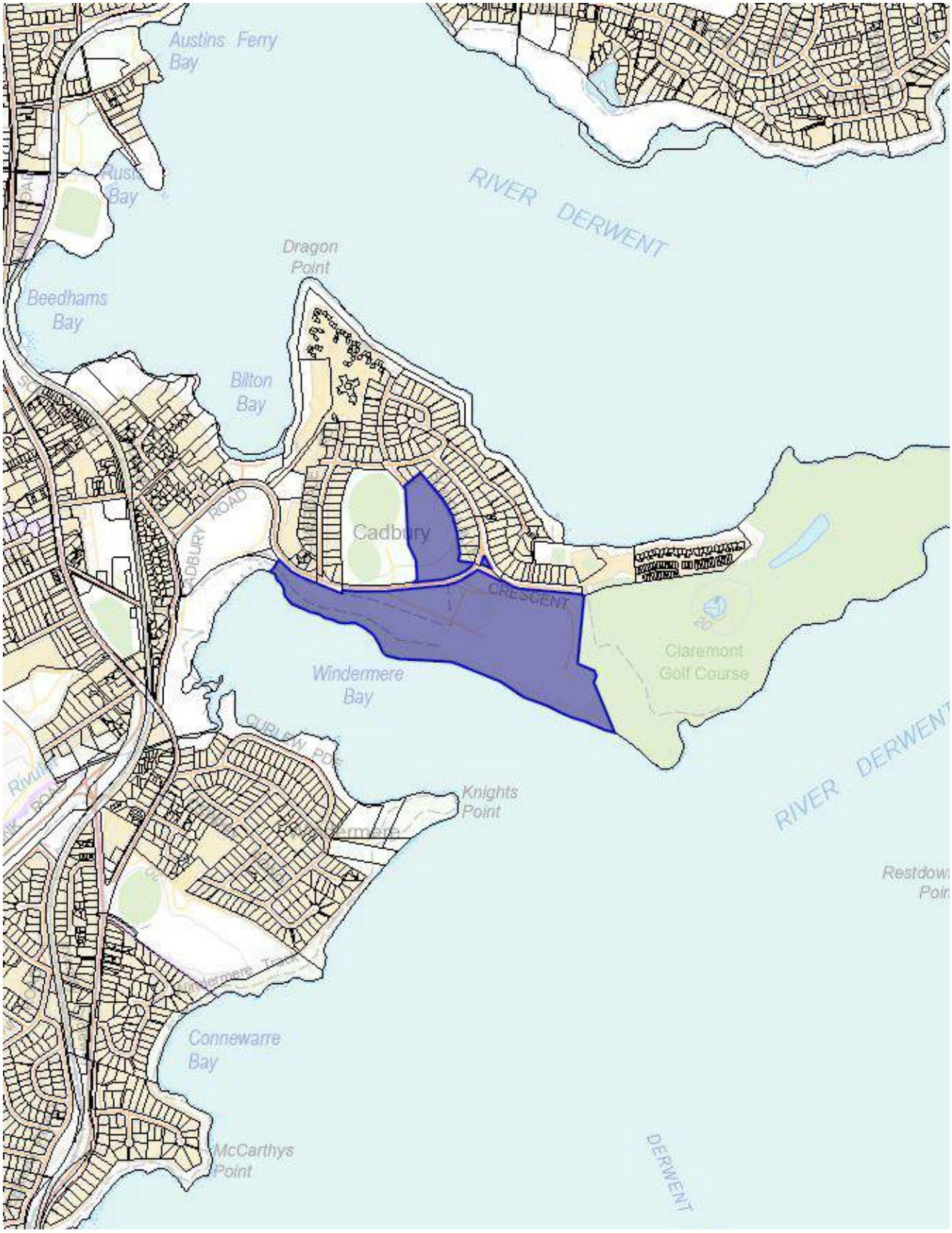


Figure 1 Project site shown in blue

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2 Project description

2.1 Overview

The Project is for a new visitor experience located in the parklands of the Cadbury chocolate factory site.

The chocolate experience at Cadbury (CEC) is a purpose-built, multi-level visitor attraction co-located on the industrial site known as the Cadbury Claremont factory. The site combines immersive chocolate experiences, food and beverage offerings, and family-friendly amenities.

The CEC will comprise a new three storey building with supporting infrastructure including new and upgraded pedestrian paths, upgraded car parking access, landscaping and wayfinding. A new jetty to Windermere Bay is a critical new piece of infrastructure, with boat transport via the Timtumili minanya/River Derwent the primary arrival method for visitors[2].

Guests will enter 'Chocolate Central': an atrium-like space, and begin their tour through a collection of immersive, multi-sensory experiences. A ticketed visitor journey to be "the world's most extraordinary chocolate experience", guests will move through a series of experience spaces blending storytelling, technology and hands-on participation.

Spaces will include a core set of experiences framed around the chocolate making story and historic interpretation of the site, from growing cacao through to final product, including celebrating the history of the Cadbury site, an opportunity to view artisan chocolatiers at work and a taste kitchen. Beyond the core experience, visitors can extend their stay through premium add-on experiences including building your own chocolate bar and a 45-minute masterclass.

Supporting the visitor experience are a series of social and leisure spaces, including the lounge, café and emporium. The lounge will be available for use by ticketed guests only or for group function bookings. The café and emporium will be available to the general public and will not require tickets to be purchased. The café will be for casual eating including indoor and outdoor dining spaces. The outdoor dining space extends from the northern side of the building, will merging with the existing parkland. The emporium will sell a range of artisan chocolate products produced in the new building as well as Cadbury products.

A summary of the key features is outlined in Table 2.

[2] Tickets to enter the experience will include boat transport to and from Sullivans Cove.

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Table 2 Key features of the proposed use and development

Item	Provision
New CEC building	A new building with maximum building height of 18.86 metres and gross floor area of 7,304m^2 across three levels (with roof plant) as follows: · Ground floor – 2,743m^2 in area containing building entrance, 'chocolate central', emporium, café, amenities and 'back of house' spaces including plant and equipment rooms, warehouse storage and commercial kitchen. · First floor – 2,098m^2 in area containing experience spaces (laboratory and tropical house, factory control room and masterclass production) as well as circulation spaces, amenities and staff facilities including offices. · Second floor - 1,995m^2 in area containing the taste kitchen, artisan chocolate making production areas and the 'chocolate lounge'. · Roof plant – 468m^2 containing plant and equipment On the northern side of the building will be a forecourt, outdoor dining area and landscaping which will merge into the surrounding parkland.
Ferry terminal (jetty)	A new jetty extending approximately 54 metres into Windermere Bay extending out from the foreshore escarpment using a piled structure. The jetty will connect to the new CEC building via a pedestrian path involving stairs and ramps ending at the forecourt. An inclinator is included as part of the jetty structure to provide wheelchair access.
Car parking and deliveries	Spaces for car parking and deliveries will be provided across discrete areas as follows: A dedicated car parking area accommodating 129 car parks and 6 motorcycle spaces. This dedicated area will be at the back of the existing Cadbury car park located on the northern side of Cadbury Road. A deliveries area (loading bay) will be provided as part of the new CEC building (located between the building and the existing factory). Access to this loading bay will be via the existing internal private service road network off Cadbury Road. In addition to the dedicated car parking area for visitors at the existing Cadbury factory car park, dedicated DDA compliant parking (3 spaces), parent and pram parking (12 spaces) and a bus loading area will be provided along the tree-lined avenue that forms part of the existing internal private service road network and is adjacent to the new CEC building. This car parking can be accommodated within the existing paved width of the service road. A bicycle parking area accommodating 20 spaces is provided for between the new CEC building and the existing internal service road.
Pedestrian paths	A new pedestrian connection from the jetty up across the riparian area to the new CEC building is proposed. The pathway will include both stair access as well as a ramp that connects to the former Cadbury Branch line which is now used as a walking track. In addition, a new dedicated pedestrian path will be provided connecting the visitor car park across Cadbury Road and through the parkland to the CEC building. A new wombat crossing on Cadbury Road is proposed as part of this pedestrian connection. All other existing pedestrian connections through the parkland and to the factory will be retained.
Landscaping and outdoor seating	On the northern side of the new CEC building an area of outdoor seating associated with the café is proposed, designed cohesively using soft and hard landscaping treatments. Detailed design of this landscaped area will be resolved in the condition endorsement phase, should the application be approved. As part of the landscaping as well as heritage mitigation response, a program of succession planting for the avenue of trees along the internal service road is also proposed.

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2.2 Demolition

There is no demolition proposed as part of the application.

2.3 Built form

The new CEC building is designed to appear as an extension to the existing factory, and will be uniform in shape. The building design adopts a utilitarian shape and massing so that it complements the industrial characteristics of the site and reads as part of the broader factory complex.

The lower level of the building is expressed as a robust structural plinth with upper levels clad in folded aluminium, the inspiration of which is drawn from chocolate foil wrappers. The folded cladding along with window openings expressed through 'drawing back' the cladding as well as an entrance canopy to provide visual identification for the pedestrian entrance, provides visual internal and building articulation. The entrance canopy on the northern side of the building and the northern landscaping treatments softens the connection to the surrounding landscaping and links internal and external activities.

Internally, the building is designed around the 'chocolate central' atrium, with upper levels arranged in a 'u-shape'.

The site of the new building is relatively level, meaning minimal ground disturbance and negligible cut and fill. While there is some slight variation in building height due to design features and roof top plant rooms, overall, the building height is generally around 17 to 18 metres across the building. The maximum building height is 18.86 metres.

Detail on the design strategy is outlined in the separately available DA Architectural Report prepared by Cumulus Studio.

2.4 Use

The primary use proposed is the chocolate experience which is for the purposes of providing an immersive experience for visitors to the Southern Tasmania region. The CEC is intended to attract over 400,000 visitors annually, becoming one of Tasmania's top tourist attractions, while providing an opportunity for education partnerships and career pathways in tourism and manufacturing. The CEC falls within the definition of Tourist Operation use class under Table 6.2 of the planning scheme (see section 5.4.1). The CEC is a ticketed experience and a highly managed use. Visitor arrivals are intended to be controlled through the ticketing process including mode of arrival. More details on visitation and visitor management is outlined in section 2.4.7.

As outlined in section 2.1, the proposed emporium and café are intended to be available to the general public and will not be limited to ticketed guests who access the chocolate experience.

The proposed emporium will sell chocolate-based products produced on site or by Mondelēz through the broader network of factories, as well as products used in chocolate making on site and a small range of complementary merchandise[3]. The proposed café, including indoor and outdoor seating areas, will provide casual dining with a servery and no table service.

[3] Limiting retailing activities to avoid a broader range of general goods and services sold on site can be resolved by way of condition.

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All other infrastructure and facilities provided including the jetty and the car park are provided to support the chocolate experience.

In addition to the daytime use, there will be occasional use of 'chocolate central' for privately booked functions. These types of events may include welcome events or small social gatherings. These will be more incidental in frequency. It is envisaged these events will accommodate up to 600 people with all guests arriving via boat.

2.4.1 Distribution of uses

2.4.1.1 Scenario one: Day to day operations

Scenario one is the use distribution of the site during standard daily operation.

Table 3 Scenario one use distribution

Proposed use class	Composition	Approximate area
Tourist Operation	Full CEC site excluding emporium and café[4]	5,837m^2
	Toilets (public access)	38 m^2
General Retail and Hire	Emporium	278 m^2
Food Services	Café (indoor seating)	185 m^2
	Café (outdoor dining)	181 m^2
	Café (servery)	139 m^2
	Café (kitchen)	178 m^2
	Total seating capacity (indoor and outdoor)	280 seats

2.4.1.2 Scenario two: Function space

Scenario two is the use of the site when it is utilised as a function space in the evening hours. Functions will be held in 'chocolate central' comprising an area of 738m^2 or the lounge for smaller events of up to 50 people.

2.4.2 Hours of operation

The CEC will be open daily from 9am to 6pm, including public holidays (except Christmas Day) The first ferry of the day will arrive at 9am, and the last ferry will depart at 6pm. Private functions in 'chocolate central' will be held from 6pm to 11pm.

Staff may be on site outside of these hours for security or administrative purposes.

[4] For the purposes of conservative car parking calculations, MCG have classified the chocolate lounge as food services, even though it forms an ancillary and subservient component of the Tourism Operation use class. In addition the servery and kitchen have not been included in the calculation of floor area for the purposes of car parking demand for the café component.

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2.4.3 Commercial vehicle movements

Three daily deliveries (small service trucks) will arrive between 7 am and 6.00pm Monday to Saturday and between 8.00am to 9.00pm Sunday and public holidays.

2.4.4 Staffing

CEC staff and contractors will be onsite daily between 7am and 8pm, except when events are being held. There will be 6 office and management staff, and 43 experience and services staff onsite daily. These staff will cover ticketing, guest services, retail, café operations, cleaning, experience facilitation and management.

In total the Project will provide employment for 78 FTE employees, although a maximum of 49 employee will be present on site at any one time, due to rostering of staff across different periods.

Security staff will be onsite from 6pm to 9am daily.

2.4.5 Ticketed experiences

For the primary Tourist Operation component of the use, visitors will be able to purchase tickets for three core timed experiences:

- The Immersive Tour, which includes multiple interactive zones across Levels 1 and 2.
- Within the Immersive Tour - purchase at additional cost a “Build Your Own Bar” product
- The Chocolate Master Class, a hands-on, small-group chocolate-making session located on Level 1.
- The Chocolate Lounge, a fixed-time, seated dessert degustation experience on Level 2.

A valid ticket to any of these three experiences grants access to Chocolate Central, the entry hub and orientation space for all guests.

2.4.6 Public access

Access open to the general public during the 9am to 6pm operating hours are limited to:

- The Emporium, which offers chocolate products and merchandise.
- The café and toilets
- Outdoor seating and landscaped area

The toilets will be secured outside of business hours. The surrounding parkland will remain open to the public at all times, as per current conditions.

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2.4.7 Visitation and capacity

The CEC is envisaged to attract over 400,000 visitors per year[5] as shown in the separately available visitor arrivals assessment prepared by Evolve Tourism and BDA Marketing[6]. Consumer research indicates that the CEC visitors will be primarily from the interstate and international market comprising approximately 80% of visitors to the site, with remaining as intrastate visitors including locals.

The research has indicated that of the total visitation 96% of visitors will purchase at least 1 of the 3 ticket types available: Chocolate Immersion Tour; Chocolate Lounge; or Master Class. Therefore, the vast majority of arrivals can be directly managed through the ticketing process including a requirement to pre-purchase tickets and tickets allocated to mode and time of arrival. Ferry allocated tickets will require validation on boarding the ferry in Hobart, meaning that these tickets can not be used to arrive by road. The proportion of ferry v road arrival tickets can be proportionate in order to effectively manage traffic and parking.

Approximately 4% of visitors each year (around 19,000 people) are expected to visit only the publicly accessible aspects: Emporium and Café. The is an average of approximately 53 people per day. Similar numbers to many local cafes and shops across residential areas in Greater Hobart.

Visitation to the site, particularly ticketed experiences,will however vary across the year as shown in Table 4. Consistent with typical seasonal visitation to Tasmania as evidenced in the data collected by Tourism Tasmania in the Tasmanian Visitor Survey, peak visitation is likely to occur in January through to March with the lowest visitation around October.

	Visitors to ticketed experiences				Potential non-ticketed visitors
	Interstate / International	Intrastate	Total		
Year 1 (YT Dec 28)	334k	78k	412k		19k
Year 2 (YT Dec 29)	340k	80k	420k		19k
Year 3 (YT Dec 30)	345k	81k	426k		20k
Year 4 (YT Dec 31)	348k	82k	430k		20k
Year 5 (YT Dec 32)	352k	83k	435k		20k

Figure 2 Baseline demand potential (Evolve Tourism)

Table 4 Monthly and daily visitation targets .

[5] By way of comparison the Tasmanian Visitor Survey for the year ending September 2025, showed that the top attractions in Tasmania, were Salamanca Market at 453, 000 visitors and Kunayni/Mount Wellington at 404,000 visitors. MONA was 318,000 visitor per year. The visitor estimates put forward under the proposal are therefore comparable, if not slightly higher than similar Greater Hobart based attractions and therefore represent an appropriate and reasonable basis in order to assess potential impacts through a planning permit application.

[6] The demand assessment was a sample of over 1,000 respondents a statistically robust sample for large population surveys. The sample size is similar to that undertaken for the Tasmanian Visitor Survey, but also broad scale community research undertaken in Australia for government and polling purchases. It provides around a 95% confidence level in results.

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Month	# day	% loading	Total monthly no.
January	31 days	12.28%	53,432
February	28 days	11.34%	49,335
March	31 days	12.28%	53,432
April	30 days	12.10%	52,656
May	31 days	5.66%	24,625
June	30 days	4.73%	20,571
July	31 days	6.60%	28,721
August	31 days	4.73%	20,571
September	30 days	5.66%	24,625
October	31 days	7.19%	31,266
November	30 days	8.13%	35,363
December	31 days	8.43%	36,656

The busiest day is anticipated to be 2,350 visitors, using a peak day in February. Visitation to the site on any one day is however not expected to be even throughout the day as shown in Table 2.7 of the Traffic Impact Assessment, available separately. As a timed ticketed experience, the operators will maintain a high degree of control over visitation at any one time based on the building capacity. The building is designed to accommodate a maximum of 1,039 people on-site at any one time, with the timed ticketed system which will only allocate times to suit this capacity.

2.4.8 Events

The parkland will be open to public and community events on request. These events are a continuation of current occasional use for things like the Cadbury Marathon and would fall within the exemption for occasional use under clause 4.1.2 of the planning scheme.

2.5 Ancillary infrastructure and services

2.5.1 Ferry terminal (jetty)

The Project involves a ferry terminal that will be located to the south of the site. The ferry terminal involves construction of a new jetty from the riparian area to the south of the new CEC building (at approximately 12.5 m in elevation) extending out over the escarpment with a new landing before stepping down across the water using stairs suspended across a piled structured ending in an arrival landing at approximately 3.5 m above the water level. Boats will pull up to structural dolphins located further out into Windermere Bay with passengers moving across to the arrival landing via a moveable ramp.

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2.5.2 Vehicle and pedestrian access

Vehicles will access the existing car park via Cadbury Road. Entry and exit of the existing carpark will be reconfigured to prioritise pedestrian movement and integrate disabled parking bays. Commercial vehicles for loading and unloading will use the existing Cadbury Service Road (private access road) via Cadbury Road to access a new dedicated loading bay for the proposed development.

An accessible pathway will be constructed, connecting the ferry jetty to the CEC building for pedestrians arriving by ferry. Alternative pedestrian access to the CEC building will be via the existing footpath network, with connections to Cadbury Road and the rail trail. The footpath network will be upgraded to improve pedestrian connectivity. The rail trail will be retained as a connected experience for both cyclists and pedestrians.

2.5.3 Car park

Minor works to the existing car park will occur to enable the proposed use. This includes:

- Fencing to delineate the factory employee parking and the CEC parking.
- The factory employee car parking will be located in the front two thirds of the existing car park using the existing eastern access as its dedicated access point. 303 employee car spaces will be retained, with 3 car spaces removed to facilitate a new aisle due to the proposed fencing.
- The CEC parking will be located in the rear third of the existing car park with the existing western access its dedicated access point. 129 spaces in total will be provided along with 6 motorbike spaces.
- Creation of a new pedestrian path including new wombat crossing across Cadbury Road extending from the CEC building, through the parkland and once across Cadbury Road alongside the dedicated access for the CEC car park.

In addition to the dedicated car park, within the existing internal service road that forms a tree-lined avenue, a dedicated bus drop off zone, 3 drop off vehicle spaces 3 DDA car spaces and 9 parent and pram spaces will be provided. In total 144 parking spaces will be provided. A bicycle parking area will also be located on the northern side of the CEC building as shown on the landscape plans.

2.5.4 Services

The Project also involves relocating existing TasWater and private stormwater assets on site with new underground infrastructure.

2.6 Signage

No signage is included with this application.

2.7 Vegetation and landscaping

All native vegetation within the site is classified under TASVEG as *Allocasuarina verticillata* forest (NAV). This community is not listed as a threatened vegetation type under the *Nature Conservation Act 2002*. The remainder of the site is classified as urban areas (FUR), which comprises cleared modified land. Further information on vegetation present onsite is contained in the Natural Values Assessment prepared by North Barker Ecosystem Services and provided separately.

Within the site there is also an avenue of exotic pine trees (*pinus Radiata*) as well as other isolated exotic tree plantings.

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A Landscaping Plan has been prepared for the development and is provided separately. Landscaping proposed for the site includes:

- Pedestrian paths and wayfinding.
- Native planting around the CEC building. The planting embraces an endemic palette that reinforces the site's natural character while supporting the parkland setting of the development.
- Succession planting beneath the existing pine avenue on the southern and northern side of Cadbury Service Road, protecting the avenue approach into the future.
- A building forecourt which activates the existing parklands for visitors and community. The forecourt provides a flexible seating arrangement, supporting programmed and informal use.
- Bio-filtration wetland planted with endemic plants in the 'service yard' on the southern side of the CEC building. Through water-sensitive urban design principles, overland water is guided towards the wetland. This system provides both functional and visual amenity – supporting on-site water detention requirements while enhancing the site's habitat values.

Two potential swift parrot habitat trees (*Eucalyptus Ovata*) are located within the building footprint and will be removed. The trees are not subject to any protections under the planning scheme and as outlined in the North Barker Ecosystem Services (NBES) terrestrial Natural Values Assessment (NVA) will not have a significant impact on any matter of national environmental significance.

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3 The site and surrounds

3.1 Site description

The site is comprised of three parcels of land. The primary parcel at 100 Cadbury Road, Claremont, Tasmania and is known as the Cadbury chocolate factory. It has a site area of 15.17ha.

The existing chocolate factory has operated on the site since 1918 and is a premises regulated by the Environment Protection Authority Tasmania (EPA) under the *Environmental Management and Pollution Control Act 1994* (EMPC Act). The site has strong community and inter-generational associations arising from the long-time involvement of Cadbury (and its various parent entities) both as a major employer and supporter of local initiatives.

The Cadbury chocolate factory site comprises three core areas: the main factory area which is fenced off from public access and is located on the eastern half of the site. This is the area regulated by the EPA under the EMPC Act. The proposed use and development is located outside of the area regulated under the existing EPN No. 7093/4 and it will not impact the existing manufacturing operations on the site.

The northernmost section of the site on the opposite side of Cadbury Road provides car parking for the existing factory. It is used by employees and visitors to the site.

The western section of the site consists of gardens associated with the factory's heritage. Along the foreshore, the site facilitates a recreational walking track. It is in this western section that the proposed use and development is located.

Aerial photography of the site is included in Figure 1.

3.2 Surrounding area

The Cadbury chocolate factory was developed as a model village, which included homes for workers, parks, educational and recreational facilities. The peninsula surrounding the factory subsequently came to be known as Cadbury Estate. The houses, the factory and the parkland setting are demonstrative of garden city ideals that emerged in the modernist period of the early 20th century. The Tasmanian location for the Cadbury factory was selected in preference over Victorian and New South Wales sites specifically because of its extended landscape setting between 'the mountain and the sea'.

On Bournville Crescent are a collection of 16, separately listed, and historically associated, significant houses. They are part of a group that was constructed in 1921 as part of the development of the chocolate factory. The Cadbury-Fry-Pascal company believed that their prosperity depended on the conditions of their workers and as a result they provided worker housing. The houses are regarded as important to the community's sense of place[7].

[7] Tasmanian Heritage Register Datasheets 7160-7175

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Nearby recreation facilities including a golf course, tennis courts, cricket ground and bowling green were developed as part of the Cadbury Model Village and remain in use today. The golf course is adjacent to the site, on the eastern side of the Cadbury Chocolate Factory. It comprises approximately 37 ha of land extending to the eastern end of the peninsula. The bowls club is located to the north-east of the site, adjacent to the golf course. The Cadbury sports centre, comprising the cricket grounds and tennis courts, adjoins the site at the western side of the car park.

Approximately 150 m to the west of the site is the Claremont Primary School site. While no longer operational, the school site has significant historical association with the Cadbury estate. The Statement of Significance is as follows:

> *Claremont Primary School is of historic cultural heritage significance because it has historical and social associations with the development of State education infrastructure within communities during the early twentieth century. Claremont Primary School is a rare example of collaboration between private enterprise (Cadbury) and the Education Department in establishing a school to service both the Cadbury workers families and the general community. Claremont Primary School demonstrates the principal characteristics of an Inter-war educational style building. The 1924/36 building is an important and prominent element in the streetscape of Cadbury Road. Claremont Primary School has special association with Cadbury and the symbiotic relationship between the school and Cadbury workforce is widely recognised by the community*[8].

An adjacent parcel of land (139356/2) is listed in the Glenorchy LPS as it contains alignment of the former Cadbury Branch line rail formation, which was constructed specifically to support the operational needs of the Cadbury factory from its inception[9]. The LPS describes the heritage values as follows:

> *The alignment and formation of the former rail spur original a key element in the passenger and freight chain servicing the Cadbury factory with direct links to the Main Line railway at Claremont.*

Recent nearby development includes the 'Northshore' apartment townhouse development located on Bourneville Crescent, adjoining the golf course to the east of the site.

More detail on the site and surrounding area's history is in the separately available Heritage Impact Assessment prepared by Purcell.

3.3 Site restrictions

The site is subject to a small number of easements including an electricity infrastructure easement as shown in the schedule of easements in the title documentation. The Project does not affect any of these.

In addition, there are existing Council and TasWater assets that extend through the site, some of which are being relocated as part of the Project and are described at section 2.5.4.

[8] Tasmanian Heritage Register Datasheet 11600

[9] *Tasmanian Planning Schame – Glenorchy* (GLE-C6.1.61)

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3.4 Site photos



Figure 3 Viewing along Cadbury Road towards the site. From this vantage point the development will not be visible.



Figure 4 Looking towards location of the new CEC building from the Cadbury parkland

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Figure 5 View from near existing security lodge across to existing car park.



Figure 6 View of internal service road and Cadbury Road intersection.

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4 Engagement

4.1 Community engagement

The project team has undertaken community engagement with the residents in the local area surrounding the proposed development.

Two community information sessions were held on 9 December 2024 and 10 September 2025. The concept plans were presented to the community, who were then invited to provide feedback and ask questions. The key concerns raised by the community are addressed in Table 5.

Table 5 Key community concerns and response

Concern	Response
Potential noise impacts	Noise impacts are addressed in the Noise Impact Assessment prepared by NVC. NVC concludes that noise emissions related to the Project are not expected to result in an unreasonable loss of residential amenity.
Overflow parking reducing the availability of off-street parking in the area	Traffic impacts are addressed in the Traffic Impact Assessment Report prepared by MCG Consult. MCG Consult concludes that demand for car parking will be satisfied by the proposed car parking provisions.
Traffic impacting the efficiency of the local road network	Traffic impacts are addressed in the Traffic Impact Assessment Report prepared by MCG Consult. MCG Consult concludes that the proposed development will not have a notable impact on the wider road network.
Extent to which public access to the existing parkland would be impacted	Most of the parkland will remain open and be accessible to the public.
Extent to which the local community will be able to access the experience	Non-ticketed aspects of the experience, like the café and emporium, will be accessible for free.

In addition to the community information sessions, the project proponent also attended a family day for Cadbury Employees on 7 December 2024 and held one-on-one meetings with the Claremont Bowls Club on 4 December 2024 and Claremont Golf Club on 9 December 2024. No further major concerns were identified.

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4.2 Stakeholder engagement

4.2.1 Council engagement

Preliminary discussions have been held with Council officers coordinated through Era Advisory. This has included a briefing on the design with Council's planners as well as review of draft stormwater and traffic impact documentation.

4.2.2 TasWater engagement

Collective Engineering have had preliminary conversations by email in preparing concept servicing documentation.

4.2.3 Crown lands engagement

Pre-lodgement discussions have been held with Property Services under the Tasmanian Parks and Wildlife Service in relation to Crown consent, including provision of draft documentation for review.

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5 Planning scheme controls

5.1 Statutory controls

The site is subject to the provisions of the *Tasmanian Planning Scheme – Glenorchy* (the planning scheme).

The subject site is zoned Light Industrial, General Industrial, Environmental Management, and Open Space under the planning scheme. Refer to the zoning map in Figure 7.

No works are proposed within the Open Space Zone.

The site is affected by multiple overlays. The following overlays apply to the site:

- Local heritage place (see Figure 8)
- Waterway and coastal protection area (see Figure 9)
- Future coastal refugia area (see Figure 10)
- Priority vegetation (see Figure 11)
- Coastal erosion area (see Figure 12)
- Coastal inundation hazard (see Figure 13)
- Flood-prone hazard areas (see Figure 14)
- Landslip hazard area (see Figure 15)

The site is not included on the Tasmanian Heritage Register.

5.2 Specific Area Plan

The site is subject to the Cadbury Visitor Experience Specific Area Plan (SAP). Assessment against the SAP is included in Section 6. The provisions of the SAP are in addition to and in substitution for the provisions of the Light Industrial Zone, General Industrial Zone, and Local Historic Heritage Code, where specified in the relevant provision.

5.3 Relevant codes

The following codes from the planning scheme are applicable to the application:

- C2.0 Parking and Sustainable Transport Code
- C3.0 Road and Railway Assets Code
- C6.0 Local Historic Heritage Code
- C7.0 Natural Assets Code
- C11.0 Coastal Inundation Hazard Code

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- C12.0 Flood-Prone Areas Hazard Code
- C14.0 Potentially Contaminated Land Code
- C15.0 Landslip Hazard Code

5.4 Proposed uses

5.4.1 Use class

The principal chocolate experience on the site falls under the Tourist Operation use class as its primary purposes is to attract tourists to the site. Most facilities provided within the building as well as the jetty, car parking and access are considered to be directly associated with and subservient components of that use in accordance with clause 6.2.2 of the planning scheme.

As the emporium and café (including outdoor dining area) will be available to the general public without a ticket, these uses are most appropriately considered standalone uses, even though they remain small scale in comparison to the overall Tourist Operation and on the basis of the research undertaken by BDA Marketing, will attract only small numbers of people to the site.

The night-time use of 'chocolate central' is also considered to not be a directly associated with and subservient component of the Tourist Operation use class. While function guests will be able to enjoy the 'chocolate central' space while there and be provided with a dining and event experience that draws on the chocolate experience, the remaining experience spaces will not be available during the events, except for the lounge which will be available for smaller night time events as well.

The proposed use classes and their definitions are summarised below in Table 6.

Table 6 Proposed uses associated with the CEC

Proposed use class	Definition (Table 6.2 of the planning scheme)
Tourist operation	use of land specifically to attract tourists, other than for accommodation. Examples include a theme park, visitor centre or interpretation centre, wildlife park and zoo.
General Retail and Hire	use of land for selling goods or services, or hiring goods. Examples include an adult sex product shop, amusement parlour, beauty salon, betting agency, bottle shop, cellar door sales, commercial art gallery, department store, hairdresser, market, primary produce sales, local shop, shop, shop front dry cleaner and supermarket.
Food Services	use of land for selling food or drink, which may be prepared on the premises, for consumption on or off the premises. Examples include a cafe, restaurant and take away food premises.
Community Meeting and Entertainment	use of land for social, religious and cultural activities, entertainment and meetings. Examples include an art and craft centre, place of worship, cinema, civic centre, function centre, library, museum, public art gallery, public hall and theatre, community centre and neighbourhood centre.

The use statuses of the proposed uses are summarised in Table 7.

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5.4.2 Use status

Table 7 Use status of proposed uses

Zone	Proposed use	Applicable clause	Qualification	Use status
Light Industrial	Tourist Operation	GLE-S15.5 Use Table	For a visitor experience associated with the Cadbury Chocolate Factory	Discretionary
General Industrial	Tourist Operation	GLE-S15.5 Use Table	For a visitor experience associated with the Cadbury Chocolate Factory	Discretionary
	General Retail and Hire	GLE-S15.5 Use Table	Where part of a visitor experience associated with the Tourist Operation	Discretionary
	Food Services	Clause 19.2 Use Table	N/A	Discretionary
	Community Meeting and Entertainment	GLE-S15.5 Use Table	Where part of a visitor experience associated with the Tourist Operation	Discretionary
Environmental Management	Tourist Operation	Clause 23.2 Use Table	If not listed as Permitted	Discretionary

5.5 Machinery provisions

Section 6 of the planning scheme outlines the correct procedure for assessment use and development against the planning scheme.

5.5.1 Assessment against standards

Regarding assessment against use or development standards clause 5.6 requires that the Project must comply with each applicable standard and that compliance with the standard can be achieved by way of either complying with the acceptable solution or satisfying the performance criteria.

In the following sections each applicable zone, code and specific area plan is addressed. At the front part of the assessment against each of these, applicable standards are identified in a table. A response to the applicable standards follows, identifying if the acceptable solution is achieved or the performance criteria is satisfied. The conclusion at section 17 of the report summarises all applicable standards.

5.5.2 Use assessment

Regarding assessment of a discretionary use. clause 6.10.2 of the planning scheme states:

> *In determining an application for a permit for a Discretionary use the planning authority must, in addition to the matters referred to in sub-clause 6.10.1 of this planning scheme, have regard to:*

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(a) the purpose of the applicable zone;

(b) any relevant local area objective for the applicable zone;

(c) the purpose of any applicable code;

(d) the purpose of any applicable specific area plan;

(e) any relevant local area objective for any applicable specific area plan; and

(f) the requirements of any site-specific qualification,

but in the case of the exercise of discretion, only insofar as each such matter is relevant to the particular discretion being exercised.

An assessment against the purpose of the applicable zones and specific area plan is provided for in each relevant section. A conclusion on the use discretion is made at section 17 of this report. A specific assessment against code purpose statements has not been made, as none of these are considered to provide contribution or guidance as to whether the use is appropriate to the site, having regard to their statutory application to the Project.

It is noted that there are no applicable local area objectives or site-specific qualifications.

5.5.3 Use or development seaward of the Municipal District

The Project involves use and development seaward of the Municipal District, being the proposed jetty. Clause 7.11.1 of the planning scheme states:

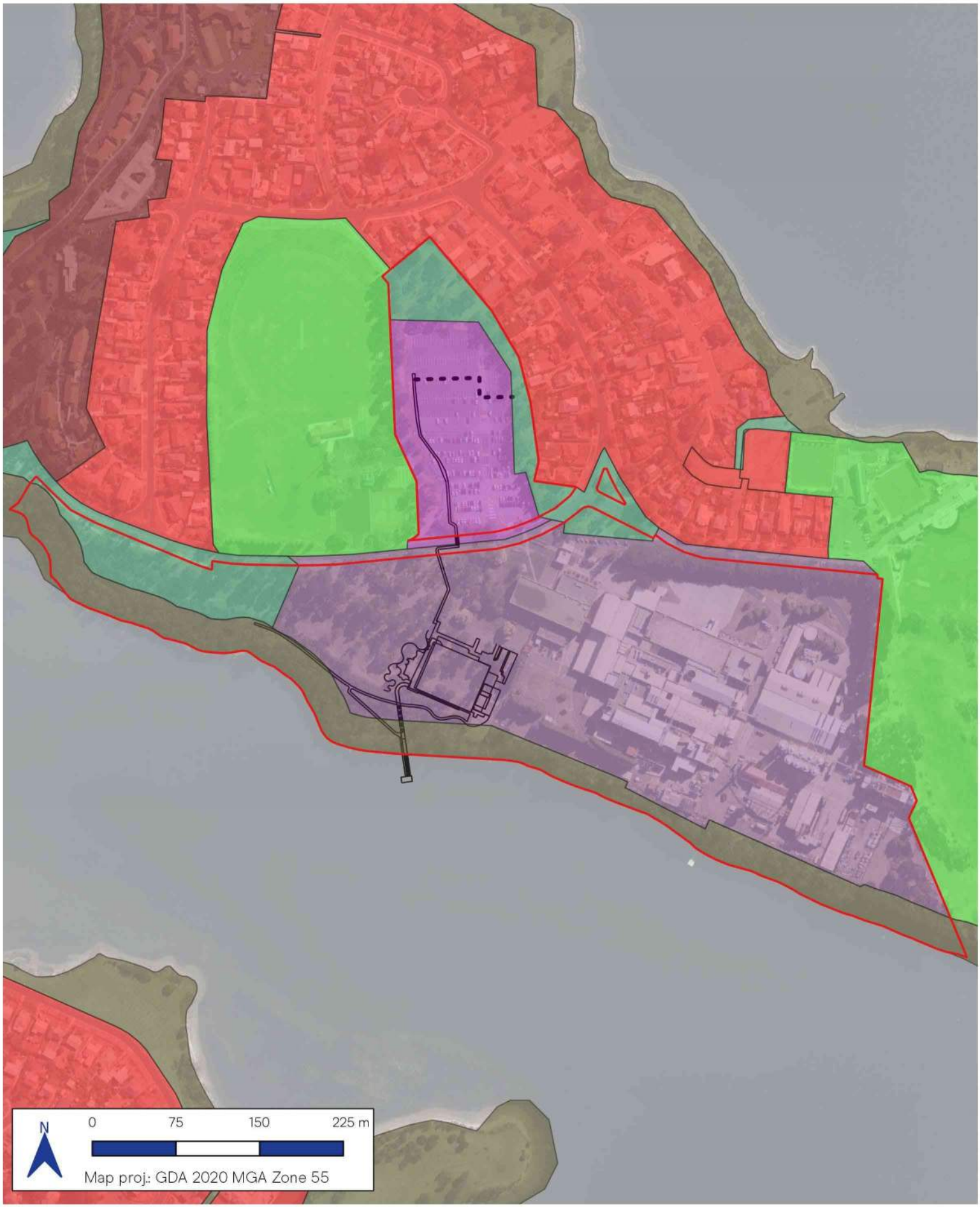
Use or development of a type referred to in section 7(a) to (d) of the Act that is unzoned in the zoning maps in the relevant Local Provisions Schedules must be considered in accordance with:

(a) the provisions of the zone that is closest to the site; or

(b) in the case of a use or development that extends from land that is zoned, the provisions of the zone from which the use or development extends.

The zone closest is the Environmental Management Zone and therefore the assessment of the jetty is included in section 7.3 of the site.

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Project Site

Proposed development footprint

Tasmanian Planning Scheme Zones

Environmental Management

General Industrial

General Residential

Inner Residential

Landscape Conservation

Light Industrial

Open Space

Recreation

Chocolate Experience at Cadbury

Figure 7
Tasmanian Planning Scheme Zones

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Rev.	Rev D
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Size	A4

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6 Cadbury Visitor Experience Specific Area Plan

6.1 SAP purpose

The purpose of the Cadbury Visitor Experience SAP is:

GLE-S15.1.1 To allow for the use and development of a Cadbury Visitor Experience, associated with the Cadbury Chocolate Factory.

GLE-S15.1.2 To ensure that the Cadbury Visitor Experience and associated uses do not cause an unreasonable loss of residential amenity in the adjacent residential zones.

GLE-S15.1.3 To ensure that development associated with the Cadbury Visitor Experience is designed to respect the heritage significance of the Cadbury Industrial Estate - Factory local heritage place.

The Project is for the purpose of creating a visitor experience centred around chocolate production and more specifically the Cadbury factory and the site's history. The Project therefore directly furthers Clause GLE-S15.1.1.

In relation to Clause GLE-S15.1.2, as outlined in regard to the assessment against applicable use standards, the Project largely complies with the acceptable solutions in relation to the amenity standards and overall represents no increase in amenity taking into account the scale and nature of existing industrial operations on the site. A Noise Impact Assessment prepared by NVC identifies that there is no predicted unreasonable loss of amenity for surrounding residential receivers, providing that the bus drop-off area is located away from residential properties, which is incorporated into the Project as shown in the architectural plans. The Traffic Impact Assessment prepared by MCG Consult also demonstrates that car parking supply is adequate and there are no anticipated impacts on nearby residential streets.

Clause GLE-S15.1.3 relates to development and is therefore not applicable to the use discretion.

6.2 Application of the SAP

The SAP applies to the site as shown in Figure 2.

6.3 Applicable standards

Table 8 Applicable standards in the Cadbury Visitor Experience Specific Area Plan

Clause	Applicability
Use Standards	

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Clause		Applicability
Clause GLE-S15.6.1 Cadbury Visitor Experience impact	A1/P1	Applicable.
	A2/P2	Applicable.
	A3/P3	Applicable.
Development Standards		
Clause GLE-S15.7.1 Siting of buildings, structures and landscape elements	A1/P1	Applicable.

6.4 Clause GLE-S15.6.1 Cadbury Visitor Experience impact

This SAP subclause is in addition to the provisions of the General Industrial Zone – Clause 19.3 Use Standards.

Acceptable Solutions	Performance Criteria
Objective	
That uses do not cause an unreasonable loss of residential amenity to residential zones.	
A1	**P1**
Hours of operation within 50m of a General Residential Zone, Inner Residential Zone or Inner Residential Zone, must be within the hours of: (a) 7.00am to 9.00pm Monday to Saturday; (b) 8.00am to 9.00pm Sunday and public holidays.	Hours of operation within 50m of a General Residential Zone or Inner Residential Zone, must not cause an unreasonable loss of amenity to the residential zone, having regard to: (a) the timing, duration or extent of vehicle movements; and (b) noise, lighting or other emissions.
Planner Response	
While the site is within 50m of a General Residential Zone, none of the Project except for part of the visitor car park will be within this area. Under Table 3.1 of the planning scheme, 'hours of operation' are defined as: *...the hours that a use is open to the public or conducting activities related to the use, not including routine activities normally associated with opening and closing or office and administrative tasks.* General hours of operation of the CEC will be between 9am and 6pm every day except for Christmas Day. The only elements of the Project which will occur outside of these hours will be functions in 'chocolate central' which will occur from 6pm to 11pm Wednesday through to Saturday. Given during this use the car park will not be relied on, the Project therefore complies with A1.	
A2	**P2**
External lighting within 50m of a General Residential Zone or Inner Residential Zone, must: (a) not operate within the hours of 11:00pm to 6:00am, excluding any security lighting; and (b) if for security lighting, be baffled so that direct light does not extend into the adjoining property.	External lighting within 50m of a General Residential Zone or Inner Residential Zone, must not cause an unreasonable loss of amenity to the residential zone, having regard to: (a) the level of illumination and duration of lighting; and (b) the distance to habitable rooms of an adjacent dwelling.

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Planner Response

No new external lighting within 50 m of the General Residential Zone is proposed. None of the Project, except for part of the visitor car park, is within 50 m of the General Residential Zone. Lighting of this car park is existing and is not required for the Project, but rather for existing factory operations.

The acceptable solution (A2) is met.

A3	P3
Commercial vehicle movements and the unloading and loading of commercial vehicles within 50m of a General Residential Zone, Inner Residential Zone, must be within the hours of: (a) 7.00am to 9.00pm Monday to Saturday; (b) 8.00am to 9.00pm Sunday and public holidays.	Commercial vehicle movements and the unloading and loading of commercial vehicles on a site within 50m of a General Residential Zone or Inner Residential Zone, must not cause an unreasonable loss of amenity to the residential zone, having regard to: (a) the time and duration of commercial vehicle movements. (b) the number and frequency of commercial vehicle movements; (c) the size of commercial vehicles involved; (d) manoeuvring required by the commercial vehicles, including the amount of reversing and associated warning noise; (e) any noise mitigation measures between the vehicle movement areas and them adjoining residential area; and (f) potential conflicts with other traffic.

Planner Response

Three daily small service trucks will arrive between 7.00am and 6.00pm Monday to Saturday and 8.00am to 6.00pm on Sundays and public holidays.

The acceptable solution (A1) is met.

6.5 Clause GLE-S15.7.1 Siting of buildings, structures and landscape elements

This subclause is in substitution to the provisions of the Local Historic Heritage Code – Clause C6.6.4 Siting of buildings and structures.

Acceptable Solutions	Performance Criteria

Objective

That the siting of buildings, works and landscaping for a Cadbury Visitor Experience:

(a) is compatible with the local historic heritage significance of the Cadbury Industrial Estate - Factory local heritage place; and

(b) considers the site's heritage setting.

A1	P1
No Acceptable Solution.	The siting of buildings, works and landscaping for the Cadbury Visitor Experience must be designed to be compatible with the local historic heritage significance of the Cadbury Industrial Estate - Factory local heritage place, having regard to: (a) the historic heritage values of the local heritage place as identified in GLE-Table C6.1 Local Heritage Places;

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(b) any historic heritage values as identified in a report prepared by a suitably qualified person;

(c) the topography of the site;

(d) the size, shape, and orientation of the lot;

(e) retention of the clear connection between the Cadbury Factory and its extensive open parklands and setting west of the industrial buildings and plant including historical vehicular, pedestrian and tree-lined approaches to the Check Lodge and views through to the clock tower and industrial plant beyond, as shown in Figure GLE-S15.2; and

(f) the legibility of the former Cadbury Branch Line rail formation, as shown in Figure GLE-S15.2, in the landscape.

Planner Response

There is no acceptable solution and therefore the Project requires assessment against P1.

The Heritage Impact Assessment prepared by Purcell concludes that the proposed siting of the CEC building is compatible with the heritage significance of the site for the following reasons:

- It does not detract from the place's significance as a socially orientated enterprise bringing to life a new historic interpretation through a visitor experience.
- The building is designed as a building in a mature landscape setting, with landscaping forming part of the interface to the parkland.
- The characteristics of the size, shape and orientation of the lot is retained.
- The additional building footprint maintains the predominance of open space and does not affect the tapering of the lot.
- The connection between the factory and the open parklands is retained including views to the check lodge and clock tower, noting that historical evidence suggests that this was the service entrance to the building with the public entrance off Cadbury Road with the workers entrance being screened by an avenue of trees.

The performance criteria (P1) are satisfied.

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7 Zoning assessment

7.1 Light Industrial Zone

7.1.1 Zone application

The Project includes use and development in the Light Industrial Zone. This includes use of the existing car park and works to the existing car park to delineate car parking and access areas through use of bollards, fencing and line painting as well as works in the Cadbury Road reserve at CT 117174/1.

7.1.2 Zone purpose

The purpose of the Light Industrial Zone is:

18.1.1 To provide for manufacturing, processing, repair, storage and distribution of goods and materials where off-site impacts are minimal or can be managed to minimise conflict with, or unreasonable loss of amenity to, any other uses.

18.1.2 To provide for use or development that supports and does not adversely impact on industrial activity.

The proposed works in the Light Industrial Zone are subservient to the proposed Tourist Operation and are therefore a discretionary use pursuant to the GLE-S15.5 Use Table.

The proposed works in the Light Industrial Zone will support and not adversely impact on industrial activity. As the proposed use is a Tourist Operation that is for the purposes of providing an opportunity for visitors to experience chocolate making, linking with the existing industrial functions of the site as well as the site's history, it will be complementary to existing uses. For this reason, proposed works in the Light Industrial Zone are consistent with the zone purpose through clause 18.1.2.

7.1.3 Applicable standards

Table 9 Applicable standards in the Light Industrial Zone

Clause	Applicability	
Use Standards		
Clause 18.3.1 All uses	A1/P1	Applicable.
	A2/P2	Applicable.
	A3/P3	Applicable.

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Clause	Applicability	
Clause 18.3.2 Discretionary uses	A1/P1	Applicable. The proposed uses are discretionary in the Light Industrial Zone pursuant to the SAP (GLE-S15.5 Use Table).
Development Standards for Buildings and Works		
Clause 18.4 Development Standards for Buildings and Works	A1/P1	Not applicable. No new buildings or fencing proposed in the Light Industrial Zone.
Development Standards for Subdivision		
Clause 18.5 Development Standards for Subdivision		Not applicable. No subdivision proposed.

7.1.4 Clause 18.3.1 All uses

Acceptable Solutions	Performance Criteria
Objective	
That uses do not cause an unreasonable loss of amenity to residential zones.	
A1	**P1**
Hours of operation of a use, excluding Emergency Services, Natural and Cultural Values Management, Passive Recreation or Utilities, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must be within the hours of: (a) 7.00am to 9.00pm Monday to Saturday; and (b) 8.00am to 9.00pm Sunday and public holidays.	Hours of operation of a use, excluding Emergency Services, Natural and Cultural Values Management, Passive Recreation or Utilities, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone, or Rural Living Zone, must not cause an unreasonable loss of amenity to the residential zones, having regard to: (a) the timing, duration or extent of vehicle movements; and (b) noise, lighting or other emissions.
Planner Response	
The existing car park within the Light Industrial Zone is within 50m of a General Industrial Zone. Under Table 3.1 of the planning scheme, 'hours of operation' are defined as: *...the hours that a use is open to the public or conducting activities related to the use, not including routine activities normally associated with opening and closing or office and administrative tasks.* General hours of operation of the CEC will be between 9am and 6pm every day except for Christmas Day. The only elements of the Project which will occur outside of these hours will be functions in 'chocolate central' which will occur from 6pm to 10pm Wednesday through to Saturday. Given during this use the car park will not be relied on, the Project therefore complies with A1.	
A2	**P2**
External lighting for a use, excluding Natural and Cultural Values Management or Passive Recreation, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must: (a) not operate within the hours of 11.00pm to 6.00am, excluding any security lighting; and	External lighting for a use, excluding Natural and Cultural Values Management or Passive Recreation, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must not cause an unreasonable loss of amenity to the residential zones, having regard to: (a) the level of illumination and duration of lighting; and

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(b) if for security lighting, be baffled so that direct light does not extend into the adjoining property in those zones.	(b) the distance to habitable rooms of an adjacent dwelling.

Planner Response

The landscape report prepared by REALMstudios shows a lighting concept for the Project, that involves:

- Bollard lighting along the pedestrian path;
- Feature uplights around the CEC building;
- Integrated seat lighting in the outdoor seating area; and
- Integrated handrail light for the pedestrian connection from the CEC building to the jetty.

The proposed lighting will be operational during business hours including events which are intended to finish at 11pm.

None of the additional lighting will operator within the hours of 11pm to 6.00am and therefore the acceptable solution (A1) is met.

A3 Commercial vehicle movements and the unloading and loading of commercial vehicles for a use, excluding Emergency Services, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must be within the hours of: (a) 7.00am to 9.00pm Monday to Saturday; and (b) 8.00am to 9.00pm Sunday and public holidays.	**P3** Commercial vehicle movements and the unloading and loading of commercial vehicles for a use, excluding Emergency Services, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone, or Rural Living Zone, must not cause an unreasonable loss of amenity to the residential zones, having regard to: (a) the time and duration of commercial vehicle movements; (b) the number and frequency of commercial vehicle movements; (c) the size of commercial vehicles involved; (d) manoeuvring required by the commercial vehicles, including the amount of reversing and associated warning noise; (e) any noise mitigation measures between the vehicle movement areas and the residential area; and (f) potential conflicts with other traffic.

Planner Response

Three daily small service trucks will arrive between 7.00am and 6.00pm Monday to Saturday and 8.00am to 6.00pm on Sundays and public holidays.

The acceptable solution (A1) is met.

7.1.5 Clause 18.3.2 Discretionary uses

Acceptable Solutions	Performance Criteria

Objective

That uses listed as Discretionary do not compromise the use or development of the land for industrial activities with minimal or managed off site impacts.

A1 No Acceptable Solution.	**P1** A use listed as Discretionary must not compromise the use or development of the surrounding properties for industrial activities with minimal or managed off site impacts, having regard to: (a) the characteristics of the site;

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(b) the size and scale of the proposed use; and

(c) the function of the industrial area.

Planner Response

There is no acceptable solution for this standard. The Project must therefore be assessed against P1.

While the site is zoned for industrial purposes, surrounding properties are either in the General Residential Zone, Recreation or Open Space Zone. Therefore, there is no intent for surrounding properties to be used for industrial activities.

The performance criterion (P1) is satisfied.

7.2 General Industrial Zone

7.2.1 Zone purpose

The purpose of the General Industrial Zone is:

19.1.1 To provide for manufacturing, processing, repair, storage and distribution of goods and materials where there may be impacts on adjacent uses.

19.1.2 To provide for use or development that supports and does not adversely impact on industrial activity.

The Project in the General Industrial Zone will support and not adversely impact on industrial activity. As the proposed primary use is a Tourist Operation through a joint venture with the factory owner and operator (Mondelēz Australia) that is for the purposes of providing an opportunity for visitors to experience chocolate making, linking with the existing industrial functions of the site as well as the site's history, it will be complementary to the factory. All new use and development is outside of the factory's regulated area under their existing EPN and has no impact on factory operations. It is an opportunity to bring back to life historical visitor experiences that were previously provided but more recently ceased in a way that preserved the factory operator's operational and safety requirements.

In addition to the Tourist Operation use, the Project involves a café and emporium associated with the chocolate experience. Given that these are part of the overall experience, are relatively small scale and continue a long-established welcoming of community and visitors to the site as part of the Quaker traditions which were embodied in the factory's establishment, they are considered to support the industrial activity. In the past, the Cadbury shop was a much-loved aspect of the site by the community, and the emporium will once again provide the opportunity for locals and visitors alike to buy Cadbury chocolates onsite as well as the new boutique line produced in the CEC building.

For these reasons, the Project in the General Industrial Zone is consistent with the zone purpose through clause 19.1.2.

7.2.2 Applicable standards

Table 10 Applicable standards in the General Industrial Zone

Clause		Applicability
Use Standards		
Clause 19.3.1 Discretionary uses	A1/P1	Applicable. The proposed uses are discretionary in the General Industrial Zone pursuant to the SAP (GLE-S15.5 Use Table).

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Clause		Applicability
Development Standards for Buildings and Works		
Clause 19.4.1 Building height	A1/P1	Applicable
Clause 19.4.2 Setback	A1/P1	Applicable.
Clause 19.4.3 Landscaping	A1/P1	Applicable.
Development Standards for Subdivision		
Clause 19.5 Development Standards for Subdivision		Not applicable. No subdivision proposed.

7.2.3 Clause 19.3.1 Discretionary Uses

Acceptable Solutions	Performance Criteria

Objective

That uses listed as Discretionary do not compromise the use or development of the land for industrial activities that may have impacts on adjacent uses.

A1	P1
No Acceptable Solution.	A use listed as Discretionary must not compromise the use or development of surrounding properties for industrial activities that may have impacts on adjacent uses, having regard to: (a) the characteristics of the site; (b) the size and scale of the proposed use; and (c) the functions of the industrial area.

Planner Response

There is no acceptable solution for this standard. The Project must therefore be assessed against P1.

While the site is zoned for industrial purposes, surrounding properties are either in the General Residential Zone, Recreation or Open Space Zone. Therefore, there is no intent for surrounding properties to be used for industrial activities.

The performance criterion (P1) is satisfied.

7.2.4 Clause 19.4.1 Building height

Acceptable Solutions	Performance Criteria

Objective

To provide for a building height that:

(a) is necessary for the operation of the use; and

(b) minimises adverse impacts on adjoining properties.

A1	P1
Building height must be not more than 20m.	

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	Building height must be necessary for the operation of the use and not cause an unreasonable impact on adjoining properties, having regard to: (a) the bulk and form of the building; (b) separation from existing use on adjoining properties; and (c) any buffers created by natural or other features.

Planner Response

The maximum building height of the proposed CEC building is 18.86 m.

The acceptable solution (A1) is met.

7.2.5 Clause 19.4.2 Setback

Acceptable Solutions	Performance Criteria
Objective That the building setback is appropriate for the site.	
A1 Buildings must have setback from a frontage of: (a) not less than 10m; (b) not less than existing buildings on the site; or (c) not more or less than the maximum and minimum setbacks of the buildings on adjoining properties.	**P1** Buildings must have a setback from a frontage that provides adequate space for vehicle access, parking and landscaping, having regard to: (a) the topography of the site; (b) the setback of buildings on adjacent properties; and (c) the safety of road users.

Planner Response

The CEC building has a setback of more than 10 m from the frontage at Cadbury Road.

The acceptable solution (A1) is met.

7.2.6 Clause 19.4.3 Landscaping

Acceptable Solutions	Performance Criteria
Objective That landscaping enhances the amenity and appearance of the streetscape where buildings are setback from the frontage.	
A1 If a building is setback from a road, landscaping treatment must be provided along the frontage of the site: (a) to a depth of not less than 6m; or (b) not less than the frontage of an existing building if it is a lesser distance.	**P1** If a building is setback from a road, landscaping treatment must be provided along the frontage of the site, having regard to: (a) the width of the setback; (b) the width of the frontage; (c) the topography of the site; (d) existing vegetation on the site; (e) the location, type and growth of the proposed vegetation; and (f) any relevant local area objectives contained within the relevant Local Provisions Schedule.

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Planner Response

The CEC building has a substantial setback from the frontage onto Cadbury Road. Existing heritage parklands sit between the CEC building and the frontage. Further landscaping work is proposed to be undertaken as part of this Project. The Cadbury Services Road (private access road) also runs between the proposed building and the Cadbury Road frontage.

The landscaping plan and DA report prepared by REALMstudios demonstrates a considered and integrated landscape design that includes treatments around the building edge to transition the new building into the surrounding parkland.

The acceptable solution (A1) is met.

7.3 Environmental Management Zone

7.3.1 Zone Purpose

The purpose of the Environmental Management Zone is:

23.1.1 To provide for the protection, conservation and management of land with significant ecological, scientific, cultural or scenic value.

23.1.2 To allow for compatible use or development where it is consistent with:

(a) the protection, conservation and management of the values of the land; and

(b) applicable reserved land management objectives and objectives of reserve management plans.

The area of the site within the Environmental Management Zone represents the riparian zone of the Timtumili minanya/River Derwent environment which is inclusive of a foreshore escarpment as well as the jetty which is an accretion to the sea for the purposes of section 7 of the *Land Use Planning and Approvals Act 1993.* This land-based area is privately owned, and the past seaward area is Crown land, though it is not under any specific reserve management status and managed under the *Crown Lands Act 1976*. There are no statutory land management objectives applicable.

As outlined in the terrestrial NVA prepared by NBES, the land-based area is a relatively narrow strip of dry native woodland. At section 2.1.1 of their report, NBES state:

> *It is dominated by Allocasuarina verticillata, with Dodonaea viscosa and Bursaria spinosa commonly present in the understorey. The ground layer is generally sparse but supports a mix of grasses and sedges, including Poa rodwayi, Lepidosperma laterale, and Lomandra longifolia. The vegetation on the western side is largely in good condition. In contrast, a central section of the community is more open and weedy (Plate 3). Along the eastern side, edge effects are evident, including encroachment by Pinus radiata and significant infestations of the declared weed blackberry (Rubus fruticosus agg.). A small number of eucalypt trees are also present on the eastern side.*

In relation to the marine environment, the marine Natural Values Assessment (NVA) prepared by Marine Solutions identified that there were no significant marine values in the area and while there is some potential for minor environmental impacts, these can be appropriately mitigated and managed. Marine Solutions specifically identified that no threatened or protected species were observed during their surveys.

The proposed use and development within the Environmental Management Zone is to facilitate a jetty for the purposes of a visitor's ferry terminal and pedestrian access from the terminal through to the new building in the General Industrial Zone. It is therefore for use that is directly associated with and subservient to the Tourist Operation use and for infrastructure that relies on its location and the site's characteristics.

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Key natural and cultural values within the Environmental Management Zone will be retained and protected.

For these reasons it is considered that the Project is for a compatible use and development within the Environmental Management Zone.

7.3.2 Applicable standards

Table 11 Applicable standards in the Environmental Management Zone

Clause		Applicability
Use Standards		
Clause 23.3.1 Discretionary Uses	A1/P1	Applicable.
Development Standards for Buildings and Works		
Clause 23.4.1 Development area	A1/P1	Applicable.
Clause 23.4.2 Building height, setback and siting	A1/P1	Applicable.
	A2/P2	Applicable.
	A3/P3	Not applicable. No sensitive use proposed.
Clause 23.4.3 Exterior finish	A1/P1	Applicable.
Clause 23.4.4 Vegetation management	A1/P1	Applicable.
Development Standards for Subdivision		
Clause 23.5 Development Standards for Subdivision		Not applicable. No subdivision proposed.

7.3.3 Clause 23.3.1 Discretionary Uses

Acceptable Solutions	Performance Criteria
Objective	
That uses listed as Discretionary recognise and reflect the relevant values of the reserved land.	
A1	**P1**
No Acceptable Solution.	A use listed as Discretionary must be consistent with the values of the land, having regard to: (a) the significance of the ecological, scientific, cultural or scenic values; (b) the protection, conservation, and management of the values; (c) the specific requirements of the use to operate; (d) the location, intensity and scale of the use; (e) the characteristics and type of the use; (f) traffic and parking generation; (g) any emissions and waste produced by the use;

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(h) the measures to minimise or mitigate impacts;
(i) the storage and handling of goods, materials and waste; and
(j) the proximity of any sensitive uses.

Planner Response

There is no acceptable solution. Assessment against the performance criteria is required.

The use is considered consistent with the values of the land for the following reasons:

- The land does not have any highly significant environmental values and where present key natural and cultural features within the Environmental Management Zone will be retained and protected.
- The aspects of the Project in the Environmental Management Zone related to provision of a jetty and pedestrian access and therefore are locationally required to be in the Environmental Management Zone on the site.
- Key operations associated with the use will be in the General Industrial Zone. As demonstrated in a Noise Impact Assessment Report prepared by NVC, noise emissions from site have been deemed to be acceptable.

The performance criteria (P1) are satisfied.

7.3.4 Clause 23.4.1 Development area

Acceptable Solutions	Performance Criteria

Objective

That the development area is:

(a) compatible with the values of the site and surrounding area; and

(b) minimises disturbance of the site.

A1 The development area must: (a) be not more than 500m²; (b) be in accordance with an authority under the *National Parks and Reserve Management Regulations 2019* granted by the Managing Authority or the *Nature Conservation Act 2002*; or (c) be in accordance with an approval of the Director-General of Lands under the *Crown Lands Act 1976*.	**P1** The development area must not cause an unreasonable impact on the values of the site and surrounding area, having regard to: (a) the design, siting, scale and type of development; (b) the operation of the use; (c) the impact of the development on the values of the site and surrounding area; (d) the need for the development to be located on the site; (e) how any significant values are managed; and (f) any protection, conservation, remediation or mitigation works.

Planner Response

Proposed development within the Environmental Management Zone will be no more than 500m^2.

The Project complies with acceptable solution (A1).

7.3.5 Clause 23.4.2 Building height, setback and siting

Acceptable Solutions	Performance Criteria

Objective

That the design and siting of buildings responds appropriately to the values of the site and surrounding area.

A1	**P1**

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Building height must: (a) be not more than 6m; (b) be in accordance with an authority under the *National Parks and Reserve Management Regulations 2019* granted by the Managing Authority or *Nature Conservation Act 2002*; or (c) be in accordance with an approval of the Director-General of Lands under the *Crown Lands Act 1976*.	Building height must be compatible with the values of the site and surrounding area, having regard to: (a) the bulk and form of proposed buildings; (b) the height, bulk and form of existing buildings; (c) the topography of the site; (d) the appearance when viewed from roads and public places; and (e) the character of the surrounding area.

Planner Response

The proposed development within the Environmental Management Zone will have a maximum height of 12.5 metres and therefore the Project requires assessment against P1.

The proposed building height arises from balancing the topography of the foreshore escarpment as well as compliant access to the boat loading area on the jetty. The design of the jetty while robust for engineering reasons, is visually minimal and consistent with typical structures along the Timtumili minanya/River Derwent. The bulk of the structure is minimised through use of Treadwell FRP grating and an open structure. An older jetty already exists further along the foreshore, along with other visible infrastructure including pipelines.

The proposed development in the Environmental Management Zone is compatible with the values of the site.

The performance criterion (P1) is satisfied.

A2 Buildings must have a setback from all boundaries: (a) not less than 10m; (b) not less than the existing building for an extension; (c) in accordance with an authority under the *National Parks and Reserve Management Regulations 2019* granted by the Managing Authority and/or *Nature Conservation Act 2002*; or (d) be in accordance with an approval of the Director-General of Lands under the *Crown Lands Act 1976*.	**P2** Buildings must be sited to be compatible with the values of the site and surrounding area, having regard to: (a) the bulk and form of proposed buildings; (b) the height, bulk and form of existing buildings; (c) the topography of the site; (d) the appearance when viewed from roads and public places; (e) the retention of vegetation; (f) the safety of road users; and (g) the character of the surrounding area.

Planner Response

The proposed jetty and pedestrian access in the Environmental Management Zone does not meet any of the provisions specified in A1, as it is built across the southern boundary.

The siting of the jetty is however in direct response to practicality of facilitating boat access as close as possible to the new building location in the General Industrial Zone, while protecting key natural and cultural features on the site.

As outlined above, the design of the jetty while robust for engineering reasons, is visually minimal and consistent with typical structures along the Timtumili minanya/River Derwent. The bulk of the structure is minimised through use of Treadwell FRP grating and an open structure. An older jetty already exists further along the foreshore along with other visible infrastructure including pipelines.

The performance criterion (P2) is satisfied.

7.3.6 Clause 23.4.3 Exterior finish

Acceptable Solutions	Performance Criteria

Objective

That exterior finishes are not prominent and blend with the character of the site and surrounding area.

A1 Exterior building finishes must:	**P1**

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(a) be coloured using colours with a light reflectance value not more than 40% in dark natural tones of grey, green or brown;

(b) be in accordance with an authority under *National Parks and Reserve Management Regulations 2019* granted by the Managing Authority or the *Nature Conservation Act 2002*; or

(c) be in accordance with an approval of the Director-General of Lands under the *Crown Lands Act 1976.*

Exterior building finishes must be compatible with the character of the site and surrounding area, having regard to:

(a) the topography of the site;

(b) the existing vegetation;

(c) the dominant colours of the vegetation and surrounding area;

(d) the nature of the development;

(e) the nature of the exterior finishes;

(f) the appearance when viewed from roads and public places; and

(g) the character of the surrounding area.

Planner Response

The exterior finishes of all access walkway and jetty structures are to be confirmed in the detailed design and procurement phase. The access walkway and jetty will be coloured using colours with a light reflectance value (LRV) of not more than 40% in dark natural tones of grey, green or brown.

Exterior building materials for the jetty will be typical of material used for marine structures including dark green Treadwell FRP grating, raw concrete and steel and timber piles. All of these will be consistent with the requirements under subclause (a).

It is recommended that a condition is included in the planning permit requiring exterior finishes to be compliant with Clause 23.4.3.

The acceptable solution (A1) is met.

7.3.7 Clause 23.4.4 Vegetation management

Acceptable Solutions	Performance Criteria

Objective

That the site contributes to the values of the surrounding area by restricting vegetation removal.

A1

Building and works must:

(a) be located on land where the native vegetation cover has been lawfully removed; or

(b) be in accordance with an authority under *National Parks and Reserve Management Regulations 2019* granted by the Managing Authority or the *Nature Conservation Act 2002*.

P1

Building and works must be located to minimise native vegetation removal and the impact on values of the site and surrounding area, having regard to:

(a) the extent of native vegetation to be removed;

(b) any proposed remedial, mitigation or revegetation measures;

(c) provision for native habitat for native fauna;

(d) the management and treatment of the balance of the site or native vegetation areas; and

(e) the type, size and design of development.

Planner Response

There is some minor vegetation removal proposed in the land-based area in the Environmental Management Zone, but as outlined in the terrestrial NVA prepared by NBES there is no impact on the values of the site and surrounding area.

The performance criteria (P1) are satisfied.

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8 Parking and Sustainable Transport Code

8.1 Application of the code

The Parking and Sustainable Transport Code applies to all use and development.

8.2 Applicable standards

Table 12 Applicable standards in the Parking and Sustainable Transport Code

Clause		Applicability
Use Standards		
C2.5.1 Car parking numbers	A1/P1	Applicable.
C2.5.2 Bicycle parking numbers	A1/P1	Applicable.
C2.5.3 Motorcycle parking numbers	A1/P1	Applicable.
C2.5.4 Loading bays	A1/P1	Applicable.
C2.5.5 Number of car parking spaces within the General Residential Zone and Inner Residential Zone	A1/P1	Not applicable. Site is not within a residential zone.
Development Standards for Buildings and Works		
C2.6.1 Construction of parking areas	A1/P1	Applicable.
C2.6.2 Design and layout of parking areas	A1/P1	Applicable.
C2.6.3 Number of accesses for vehicles	A1/P1	Applicable.
	A2/P2	Applicable.
C2.6.4 Lighting of parking areas within the General Business Zone and Central Business Zone	A1/P1	Not applicable. Site is not within the General Business Zone or Central Business Zone.
C2.6.5 Pedestrian access	A1/P1	Applicable.
C2.6.6 Loading bays	A1/P1	Applicable.

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Clause		Applicability
	A2/P2	Applicable.
C2.6.7 Bicycle parking and storage facilities within the General Business Zone and Central Business Zone	A1/P1	Not applicable. Site is not within the General Business Zone or Central Business Zone.
	A2/P2	Not applicable. Site is not within the General Business Zone or Central Business Zone.
C2.6.8 Siting of parking and turning areas	A1/P1	Not applicable. Site is not within a relevant zone.
	A2/P2	Not applicable. Site is not within the Central Business Zone.
Parking Precinct Plan		
C2.7.1 Parking precinct plan	A1/P1	Not applicable. No relevant parking precinct plan.

8.3 Clause C2.5.1 Car parking numbers

Acceptable Solutions	Performance Criteria

Objective

That an appropriate level of car parking spaces are provided to meet the needs of the use.

A1

The number of on-site car parking spaces must be no less than the number specified in Table C2.1, less the number of car parking spaces that cannot be provided due to the site including container refund scheme space, excluding if:

(a) the site is subject to a parking plan for the area adopted by council, in which case parking provision (spaces or cash-in-lieu) must be in accordance with that plan;

(b) the site is contained within a parking precinct plan and subject to Clause C2.7;

(c) the site is subject to Clause C2.5.5; or

(d) it relates to an intensification of an existing use or development or a change of use where:

(i) the number of on-site car parking spaces for the existing use or development specified in Table C2.1 is greater than the number of car parking spaces specified in Table C2.1 for the proposed use or development, in which case no additional on-site car parking is required; or

(ii) the number of on-site car parking spaces for the existing use or development specified in Table C2.1 is less than the number of car parking spaces specified in Table C2.1 for the proposed use or development, in which case on-site car parking must be calculated as follows:

P1.1

The number of on-site car parking spaces for uses, excluding dwellings, must meet the reasonable needs of the use, having regard to:

(a) the availability of off-street public car parking spaces within reasonable walking distance of the site;

(b) the ability of multiple users to share spaces because of:

(i) variations in car parking demand over time; or

(ii) efficiencies gained by consolidation of car parking spaces;

(c) the availability and frequency of public transport within reasonable walking distance of the site;

(d) the availability and frequency of other transport alternatives;

(e) any site constraints such as existing buildings, slope, drainage, vegetation and landscaping;

(f) the availability, accessibility and safety of on-street parking, having regard to the nature of the roads, traffic management and other uses in the vicinity;

(g) the effect on streetscape; and

(h) any assessment by a suitably qualified person of the actual car parking demand determined having regard to the scale and nature of the use and development.

P1.2

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N = A + (C- B) N = Number of on-site car parking spaces required A = Number of existing on site car parking spaces B = Number of on-site car parking spaces required for the existing use or development specified in Table C2.1 C= Number of on-site car parking spaces required for the proposed use or development specified in Table C2.1.	The number of car parking spaces for dwellings must meet the reasonable needs of the use, having regard to: (a) the nature and intensity of the use and car parking required; (b) the size of the dwelling and the number of bedrooms; and (c) the pattern of parking in the surrounding area.

Planner Response

The proposed use generates a requirement for 143 spaces during day time operations under Table C2.1 while under evening function operations the requirement would be 200 spaces under Table C2.1. Detailed analysis of parking requirements under the planning scheme is outlined below at Table 13.

A Traffic Impact Assessment (TIA) has been prepared by MCG Consult and identifies that while during day time operations sufficient on-site car parking is proposed (in total 144 spaces including DDA and parent and pram spaces), in the night time when chocolate central is operating as a function centre the planning scheme requires a total of 200 on site car parking spaces for the CEC facility.

Consideration under P1 is therefore required. As outlined in the TIA, the proposed car parking supply is considered adequate given that ferry transport will be the primary transport mode to the site and there will be management of visitor numbers through a ticketed system. As outlined in section 2.4.7, the ticketing system will require validation on boarding of a ferry for ferry based tickets to strictly control mode of arrival to the site.

P1.1 is achieved, while P1.2 is not applicable.

Table 13 Car parking requirements under Table C2.1

	Floor area/ seating capacity	Scheme requirement	No. of spaces required	Rounding up
Scenario 1				
Tourist operation	5875 m^2	1 space per 200 m^2	29.38	30
General retail and hire	278 m^2	1 space per 30 m^2	9.27	10
Food services	683 m^2	15 space per 100 m^2	102.45	103
Food services	280 seats	1 space per 3 seats	93.33	94
			TOTAL REQUIRED	**143**
SCENARIO 2				
Function centre	738 m^2	1 space per 15 m^2	49.20	50
	600 seats	1 space per 3 seats	200.00	200
			TOTAL REQUIRED	**200**

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8.4 Clause C2.5.2 Bicycle parking numbers

Acceptable Solutions	Performance Criteria

Objective

That an appropriate level of bicycle parking spaces are provided to meet the needs of the use.

A1	P1
Bicycle parking spaces must: (a) be provided on the site or within 50m of the site; and (b) be no less than the number specified in Table C2.1.	Bicycle parking spaces must be provided to meet the reasonable needs of the use, having regard to: (a) the likely number of users of the site and their opportunities and likely need to travel by bicycle; and (b) the availability and accessibility of existing and any planned parking facilities for bicycles in the surrounding area.

Planner Response

20 on site bicycle parking spots are to be provided on the north side of the CEC building between the building and the internal service road.

This exceeds the requirement under Table C2.1 of 18 spaces as outlined in the TIA prepared by MCG Consult.

The Project complies with acceptable solution (A1).

8.5 Clause C2.5.3 Motorcycle parking numbers

Acceptable Solutions	Performance Criteria

Objective

That the appropriate level of motorcycle parking is provided to meet the needs of the use.

A1	P1
The number of on-site motorcycle parking spaces for all uses must: (a) be no less than the number specified in Table C2.4; and (b) if an existing use or development is extended or intensified, the number of on-site motorcycle parking spaces must be based on the proposed extension or intensification, provided the existing number of motorcycle parking spaces is maintained.	Motorcycle parking spaces for all uses must be provided to meet the reasonable needs of the use, having regard to: (a) the nature of the proposed use and development; (b) the topography of the site; (c) the location of existing buildings on the site; (d) any constraints imposed by existing development; and (e) the availability and accessibility of motorcycle parking spaces on the street or in the surrounding area.

Planner Response

Table C2.4 requires 1 motorcycle space plus a further space for every additional 20 car parking spaces required over 40 spaces. The parking requirement under A1 is there are 9 spaces and only 6 are being provided. The Project therefore requires assessment against P1.

The TIA prepared by MCG Consult concludes that the permitted requirement is excessive and not aligned with actual travel demand for the site and provisions of 6 spaces reasonably meets the needs of the use.

The Project satisfies the performance criterion (P1).

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8.6 Clause C2.5.4 Loading bays

Acceptable Solutions	Performance Criteria

Objective

That adequate access for goods delivery and collection is provided, and to avoid unreasonable loss of amenity and adverse impacts on traffic flows.

A1	P1
A loading bay must be provided for uses with a floor area of more than 1000m² in a single occupancy.	Adequate space for loading and unloading of vehicles must be provided, having regard to: (a) the type of vehicles associated with the use; (b) the nature of the use; (c) the frequency of loading and unloading; (d) the location of the site; (e) the nature of traffic in the surrounding area; (f) the area and dimensions of the site; and (g) the topography of the site; (h) the location of existing buildings on the site; and (i) any constraints imposed by existing development.

Planner Response

Loading vehicles will use the Cadbury Service Road to access a dedicated loading area for the proposed development. The loading area will accommodate trucks up to 12.5m long.

The acceptable solution (A1) is met.

8.7 Clause C2.6.1 Construction of parking areas

Acceptable Solutions	Performance Criteria

Objective

That parking areas are constructed to an appropriate standard.

A1	P1
All parking, access ways, manoeuvring and circulation spaces must: (a) be constructed with a durable all weather pavement; (b) be drained to the public stormwater system, or contain stormwater on the site; and (c) excluding all uses in the Rural Zone, Agriculture Zone, Landscape Conservation Zone, Environmental Management Zone, Recreation Zone and Open Space Zone, be surfaced by a spray seal, asphalt, concrete, pavers or equivalent material to restrict abrasion from traffic and minimise entry of water to the pavement.	All parking, access ways, manoeuvring and circulation spaces must be readily identifiable and constructed so that they are useable in all weather conditions, having regard to: (a) the nature of the use; (b) the topography of the land; (c) the drainage system available; (d) the likelihood of transporting sediment or debris from the site onto a road or public place; (e) the likelihood of generating dust; and (f) the nature of the proposed surfacing.

Planner Response

The parking areas associated are all existing sealed bitumen surfaces that are drained to the existing stormwater system. The exception is the extension of the service road to create the new loading bay. This will be a concrete finish and drained to a bioswale before connecting into the stormwater system as shown in the landscape plan prepared by REALMstudios and stormwater management plan prepared by MCG Consult.

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The acceptable solution (A1) is met.

8.8 Clause C2.6.2 Design and layout of parking areas

Acceptable Solutions	Performance Criteria

Objective

That parking areas are designed and laid out to provide convenient, safe and efficient parking.

A1.1

Parking, access ways, manoeuvring and circulation spaces must either:

(a) comply with the following:
  (i) have a gradient in accordance with Australian Standard AS 2890 - Parking facilities, Parts 1-6;
  (ii) provide for vehicles to enter and exit the site in a forward direction where providing for more than 4 parking spaces;
  (iii) have an access width not less than the requirements in Table C2.2;
  (iv) have car parking space dimensions which satisfy the requirements in Table C2.3;
  (v) have a combined access and manoeuvring width adjacent to parking spaces not less than the requirements in Table C2.3 where there are 3 or more car parking spaces;
  (vi) have a vertical clearance of not less than 2.1m above the parking surface level; and
  (vii) excluding a single dwelling, be delineated by line marking or other clear physical means; or

(b) comply with Australian Standard AS 2890- Parking facilities, Parts 1-6.

A1.2

Parking spaces provided for use by persons with a disability must satisfy the following:

(a) be located as close as practicable to the main entry point to the building;

(b) be incorporated into the overall car park design; and

(c) be designed and constructed in accordance with *Australian/New Zealand Standard AS/NZS 2890.6:2009 Parking facilities, Off-street parking for people with disabilities.*[10]

P1

All parking, access ways, manoeuvring and circulation spaces must be designed and readily identifiable to provide convenient, safe and efficient parking, having regard to:

(a) the characteristics of the site;

(b) the proposed slope, dimensions and layout;

(c) useability in all weather conditions;

(d) vehicle and pedestrian traffic safety;

(e) the nature and use of the development;

(f) the expected number and type of vehicles;

(g) the likely use of the parking areas by persons with a disability;

(h) the nature of traffic in the surrounding area;

(i) the proposed means of parking delineation; and

(j) the provisions of Australian Standard AS 2890.1:2004 - Parking facilities, Part 1: Off-street car parking and AS 2890.2 -2002 Parking facilities, Part 2: Off- -street commercial vehicle facilities.

Planner Response

As outlined in the TIA prepared by MCG Consult the provision of Parking, access ways, manoeuvring and circulation spaces complies with AS2890 and therefore complies with A1.1(b).

In addition, the TIA outlines that the DDA spaces are located as close to the new CEC building as possible and are designed in accordance with AS 2890.6. The Project also complies with A1.2.

[10]

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8.9 Clause C2.6.3 Number of accesses for vehicles

Acceptable Solutions	Performance Criteria

Objective

That:

(a) access to land is provided which is safe and efficient for users of the land and all road network users, including but not limited to drivers, passengers, pedestrians and cyclists by minimising the number of vehicle accesses;

(b) accesses do not cause an unreasonable loss of amenity of adjoining uses; and

(c) the number of accesses minimise impacts on the streetscape.

A1

The number of accesses provided for each frontage must:

(a) be no more than 1; or

(b) no more than the existing number of accesses,

whichever is the greater.

P1

The number of accesses for each frontage must be minimised, having regard to:

(a) any loss of on-street parking; and

(b) pedestrian safety and amenity;

(c) traffic safety;

(d) residential amenity on adjoining land; and

(e) the impact on the streetscape.

Planner Response

No additional accesses are proposed.

The acceptable solution (A1) is met.

8.10 Clause C2.6.5 Pedestrian access

Acceptable Solutions	Performance Criteria

Objective

That pedestrian access within parking areas is provided in a safe and convenient manner.

A1.1

Uses that require 10 or more car parking spaces must:

(a) have a 1m wide footpath that is separated from the access ways or parking aisles, excluding where crossing access ways or parking aisles, by:

  (i) a horizontal distance of 2.5m between the edge of the footpath and the access way or parking aisle; or

  (ii) protective devices such as bollards, guard rails or planters between the footpath and the access way or parking aisle; and

(b) be signed and line marked at points where pedestrians cross access ways or parking aisles.

A1.2

In parking areas containing accessible car parking spaces for use by persons with a disability, a footpath having a width not less than 1.5m and a gradient not steeper than 1 in 14 is required from those spaces to the main entry point to the building.

P1

Safe and convenient pedestrian access must be provided within parking areas, having regard to:

(a) the characteristics of the site;

(b) the nature of the use;

(c) the number of parking spaces;

(d) the frequency of vehicle movements;

(e) the needs of persons with a disability;

(f) the location and number of footpath crossings;

(g) vehicle and pedestrian traffic safety;

(h) the location of any access ways or parking aisles; and

(i) any protective devices proposed for pedestrian safety.

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Planner Response

The proposal provides for a 2m wide kerbed footpath that is signed and marked through the existing car park as shown in Appendix A of the TIA prepared by MCG Consult. The proposal complies with A1.1.

In addition, pedestrian access between the DDA spaces on the internal services road and the building entrance is on near flat land and therefore the Project complies with A1.2.

8.11 Clause C2.6.6 Loading Bays

Acceptable Solutions	Performance Criteria

Objective

That the area and dimensions of loading bays are adequate to provide safe and efficient delivery and collection of goods.

A1	P1
The area and dimensions of loading bays and access way areas must be designed in accordance with *Australian Standard AS 2890.2–2002, Parking facilities, Part 2: Off- - street commercial vehicle facilities*, for the type of vehicles likely to use the site.	Loading bays must have an area and dimensions suitable for the use, having regard to: (a) the types of vehicles likely to use the site; (b) the nature of the use; (c) the frequency of loading and unloading; (d) the area and dimensions of the site; (e) the topography of the site; (f) the location of existing buildings on the site; and (g) any constraints imposed by existing development.

Planner Response

As stated in the TIA report prepared by MCG Consult, the loading bay has been designed for the type of vehicles likely to use the site. In this case, it has been designed for a 12.5 m truck.

The acceptable solution (A1) is met.

A2	P2
The type of commercial vehicles likely to use the site must be able to enter, park and exit the site in a forward direction in accordance with Australian Standard AS 2890.2 – 2002, Parking Facilities, Part 2: Parking facilities - Off-street commercial vehicle facilities.	Access for commercial vehicles to and from the site must be safe, having regard to: (a) the types of vehicles associated with the use; (b) the nature of the use; (c) the frequency of loading and unloading; (d) the area and dimensions of the site; (e) the location of the site and nature of traffic in the area of the site; (f) the effectiveness or efficiency of the surrounding road network; and (g) site constraints such as existing buildings, slope, drainage, vegetation, parking and landscaping.

Planner Response

As stated in the TIA report prepared by MCG Consult, the loading bay can enter and exit the site in a forward motion while not disrupting the flow of traffic.

The acceptable solution (A2) is met.

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9 Road and Railway Assets Code

9.1 Application of the code

The Road and Railway Assets Code applies to a use or development that:

(a) will increase the amount of vehicular traffic or the number of movements of vehicles longer than 5.5m using an existing vehicle crossing or private level crossing;

(b) will require a new vehicle crossing, junction or level crossing; or

(c) involves a subdivision or habitable building within a road or railway attenuation area if for a sensitive use.

The Project will increase the amount of vehicular traffic and the number of movements of vehicles longer than 5.5 m using an existing vehicle crossing. The Road and Railway Assets Code therefore applies to this Project.

9.2 Applicable standards

Table 14 Applicable standards in the Road and Railway Assets Code

Clause		Applicability
Use Standards		
Clause C3.5.1 Traffic generation at a vehicle crossing, level crossing or new junction	A1/P1	Applicable.
Development Standards for Buildings and Works		
Clause C3.6.1 Habitable buildings for sensitive uses within a road or railway attenuation area	A1/P1	Not applicable. No sensitive use proposed.
Development Standards for Subdivision		
Clause C3.7 Development Standards for Subdivision		Not applicable. No subdivision is proposed.

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9.3 Clause C3.5.1 Traffic generation at a vehicle crossing, level crossing or new junction

Acceptable Solutions	Performance Criteria

Objective

To minimise any adverse effects on the safety and efficiency of the road or rail network from vehicular traffic generated from the site at an existing or new vehicle crossing or level crossing or new junction.

A1.1

For a category 1 road or a limited access road, vehicular traffic to and from the site will not require:

(a) a new junction;

(b) a new vehicle crossing; or

(c) a new level crossing.

A1.2

For a road, excluding a category 1 road or a limited access road, written consent for a new junction, vehicle crossing, or level crossing to serve the use and development has been issued by the road authority.

A1.3

For the rail network, written consent for a new private level crossing to serve the use and development has been issued by the rail authority.

A1.4

Vehicular traffic to and from the site, using an existing vehicle crossing or private level crossing, will not increase by more than:

(a) the amounts in Table C3.1; or

(b) allowed by a licence issued under Part IVA of the Roads and Jetties Act 1935 in respect to a limited access road.

A1.5

Vehicular traffic must be able to enter and leave a major road in a forward direction.

P1

Vehicular traffic to and from the site must minimise any adverse effects on the safety of a junction, vehicle crossing or level crossing or safety or efficiency of the road or rail network, having regard to:

(a) any increase in traffic caused by the use;

(b) the nature of the traffic generated by the use;

(c) the nature of the road;

(d) the speed limit and traffic flow of the road;

(e) any alternative access to a road;

(f) the need for the use;

(g) any traffic impact assessment; and

(h) any advice received from the rail or road authority.

Planner Response

A1.1 is not applicable as vehicular access to and from the site will not utilise a category 1 road or a limited access road.

A1.2 is also not applicable as there is no new junction, vehicle crossing or level crossing proposed.

The site does not interact with the rail network. A1.3 is not applicable.

The only applicable requirements are therefore A1.4 and A1.5.

In relation to A1.4, as outlined in the TIA prepared by MCG Consult the increase in traffic volume to and from the site will not meet the acceptable solution and assessment against P1 is required.

In relation to A1.5 all vehicular traffic will enter and exit the site in a forward direction.

The TIA addresses the performance criteria and notes:

- The project increase in traffic is still low and will not result in congestion at the site or nearby junctions.
- Traffic will primarily consist of passenger vehicles, with occasional coaches and heavy vehicles.
- The car parking layout will accommodate turning movements with separate parent and pram parking to reduce conflict.
- The existing road has adequate width and sight distances to support ingress and egress and maintains a low speed limit.

The TIA concludes that the performance criterion (P1) is achieved.

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10 Local Historic Heritage Code

10.1 Application of the code

The Local Historic Heritage Code applies to:

(a) development on land within any of the following, as defined in this code:

(i) a local heritage place;

(ii) a local heritage precinct;

(iii) a local historic landscape precinct; and

(iv) for excavation only, a place or precinct of archaeological potential; and

(b) the lopping, pruning, removal or destruction of a significant tree as defined in this code.

The site proposes development on land within a local heritage place (GLE-C6.1.24) as shown in Figure 8. The Local Historic Heritage Code applies to the Project.

10.2 Applicable standards

Table 15 Applicable standards in the Local Historic Heritage Code

Clause		Applicability
Development Standards for Buildings and Works		
Clause C6.6.1 Demolition	A1/P1	Not applicable. No demolition proposed.
Clause C6.6.2 Site coverage	A1/P1	Applicable.
Clause C6.6.3 Height and bulk of buildings	A1/P1	Applicable.
Clause C6.6.4 Siting of buildings and structures	A1/P1	Not applicable. This clause is substituted by GLE-S15.7.1 Siting of buildings, structures and landscape elements.
Clause C6.6.5 Fences	A1/P1	Not applicable. No new fences are proposed.
Clause C6.6.6 Roof form and materials	A1/P1	Not applicable. There is no replacement of existing roofs.
Clause 6.6.7 Building alterations, excluding roof form and materials	A1/P1	Not applicable. No alterations to existing buildings are proposed.
Clause C6.6.8 Outbuildings and structures	A1/P1	Not applicable. No outbuildings or structures are proposed

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Clause		Applicability
Clause C6.6.9 Driveways and parking for non-residential purposes	A1/P1	Applicable.
Clause C6.6.10 Removal, destruction or lopping of trees, or removal of vegetation, that is specifically part of a local heritage place	A1/P1	Applicable
Development Standards for Local Heritage Precincts and Local Historic Landscape Precincts		
Clause C6.7.1 Demolition within a local heritage precinct		Not applicable. Site is not within a Local Heritage Precinct or Local Historic Landscape Precinct.
Clause C6.7.2 Demolition within a local historic landscape precinct		Not applicable. Site is not within a Local Heritage Precinct or Local Historic Landscape Precinct.
Clause C6.7.3 Buildings and works, excluding demolition.		Not applicable. Site is not within a Local Heritage Precinct or Local Historic Landscape Precinct.
Development Standards for Places or Precincts of Archaeological Potential		
Clause C6.8.1 Buildings and works		Not applicable. Site is not within a Place or Precinct of Archaeological Potential.

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Proposed development footprint

Tasmanian Planning Scheme Codes

Local heritage place

Chocolate Experience at Cadbury

Figure 8
Tasmanian Planning Scheme Codes - Local Historical Heritage Code

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Job No.	2425-096
Rev.	Rev D
Date	26 Sep 2025
Size	A4

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10.3 Clause C6.6.2 Site coverage

Acceptable Solutions	Performance Criteria

Objective

That site coverage is compatible with the local historic heritage significance of local heritage places.

A1	P1
No Acceptable Solution.	The site coverage must be compatible with the local historic heritage significance of a local heritage place, having regard to: (a) the topography of the site; and (b) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person.

Planner Response

There is no acceptable solution and therefore the Project requires assessment against P1.

The Heritage Impact Assessment prepared by Purcell provides an analysis of site coverage in the context of the existing site as well as historic documentation and concludes site coverage is compatible to the heritage values of the site for the following reasons:

- The proposed siting is relative to the RL of the existing factory site and maintains a similar setback from the foreshore escarpment; and
- Historic documentation indicates site coverage on the site was allocated to be at 34.83% and the cumulative site coverage under the Project would be 18.99%.

The performance criterion (P1) is satisfied.

10.4 Clause C6.6.3 Height and bulk of buildings

Acceptable Solutions	Performance Criteria

Objective

That the height and bulk of buildings are compatible with the local historic heritage significance of local heritage places.

A1	P1
No Acceptable Solution.	The height and bulk of buildings must be compatible with the local historic heritage significance of a local heritage place, having regard to: (a) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person; (b) the character and appearance of the existing building or place; (c) the height and bulk of other buildings in the surrounding area; and (d) the setting of the local heritage place.

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Planner Response

There is no acceptable solution and therefore the Project requires assessment against P1.

The Heritage Impact Assessment prepared by Purcell concludes that the proposed height and bulk of the CEC building is compatible with the heritage significance of the site for the following reasons:

- It does not detract from the place's significance as a socially orientated enterprise bringing to life a new historic interpretation through a visitor experience.
- The building is designed as a building in a mature landscape setting.
- The character and appearance of the new building is a functionalist building drawing on the industrial characteristics of existing buildings through a new interpretation.
- The height of the building is reference from the height of existing factory structures and retains the visual prominence of key features like the silos.
- The bulk is similar to other factory buildings on the site and appears as an 'extension of the factory complex'.

The performance criterion (P1) is satisfied.

10.5 Clause C6.6.9 Driveway and parking for non-residential purposes

Acceptable Solutions	Performance Criteria

Objective

That driveways and parking for non-residential purposes are compatible with the local historic heritage significance of local heritage places.

A1	P1
Driveways and parking areas for non-residential purposes on local heritage places must be located behind the building line of buildings located or proposed on a site.	Driveways and parking areas for non-residential purposes must be compatible with the local historic heritage significance of a local heritage place, having regard to: (a) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person; (b) the loss of any building fabric; (c) the removal of gardens or vegetated areas; (d) parking availability in the surrounding area; (e) vehicle and pedestrian traffic safety; and (f) the streetscape.

Planner Response

The Project involves a new driveway and parking area in the form of the loading bay and parking along one of the service roads which is in front of the building line. The Project therefore needs to be assessed against P1.

The Heritage Impact Assessment prepared by Purcell concludes that parking and the loading bay is compatible with the heritage significance of the site for the following reasons:

- The overall landscape setting is maintained and will continue to be the dominant visual characteristic.
- There is no loss in building fabric.
- The removal of trees is appropriate and mitigated.
- The service road is already used for parking.
- The Project isolates the nominal service yard mostly behind the building line and is not prominent within the streetscape.

The performance criterion (P1) is satisfied.

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10.6 Clause C6.6.10 Removal, destruction or lopping of trees, or removal of vegetation, that is specifically part of a local heritage place

Acceptable Solutions	Performance Criteria

Objective

That the removal, destruction or lopping of trees or the removal of vegetation that is specifically part of a local heritage place does not impact on the local historic heritage significance of the place.

A1 No Acceptable Solution.	**P1** The removal, destruction or lopping of trees or the removal of vegetation which is specifically part of a local heritage place listed in the relevant Local Provisions Schedule, must not cause an unreasonable impact on the local historic heritage significance of a local heritage place, having regard to: (a) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person; (b) the age and condition of the tree or vegetation; (c) the size and form of the tree or vegetation; (d) the importance of the tree or vegetation to the local historic heritage significance of a local heritage place; and (e) any advice by a suitably qualified person.

Planner Response

There is no acceptable solution and therefore the Project requires assessment against P1.

The Heritage Impact Assessment prepared by Purcell concludes that the proposed removal of select trees that are part of the historic heritage values of the place will not result in an unreasonable impact on the heritage significance of the site for the following reasons:

- The trees to be removed will not impact the ability to interpret the place as being in a wider landscape setting.
- The tress to be removed are past their prime and starting to decline as evidenced in the Arborist Report prepared by Arbscape.
- The Project incorporates a landscape design response that involves replacement/succession plantings and a strong landscape design response founded on the garden city and Quaker principles on which the site was established.

The performance criteria (P1) are satisfied.

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11 Natural Assets Code

11.1 Application of the code

The Natural Assets Code applies to development on land within the following areas:

(a) a waterway and coastal protection area;

(b) a future coastal refugia area; and

(c) a priority vegetation area only if within the following zones:

(i) Rural Living Zone;

(ii) Rural Zone;

(iii) Landscape Conservation Zone;

(iv) Environmental Management Zone;

(v) Major Tourism Zone;

(vi) Utilities Zone;

(vii) Community Purpose Zone;

(viii) Recreation Zone;

(ix) Open Space Zone;

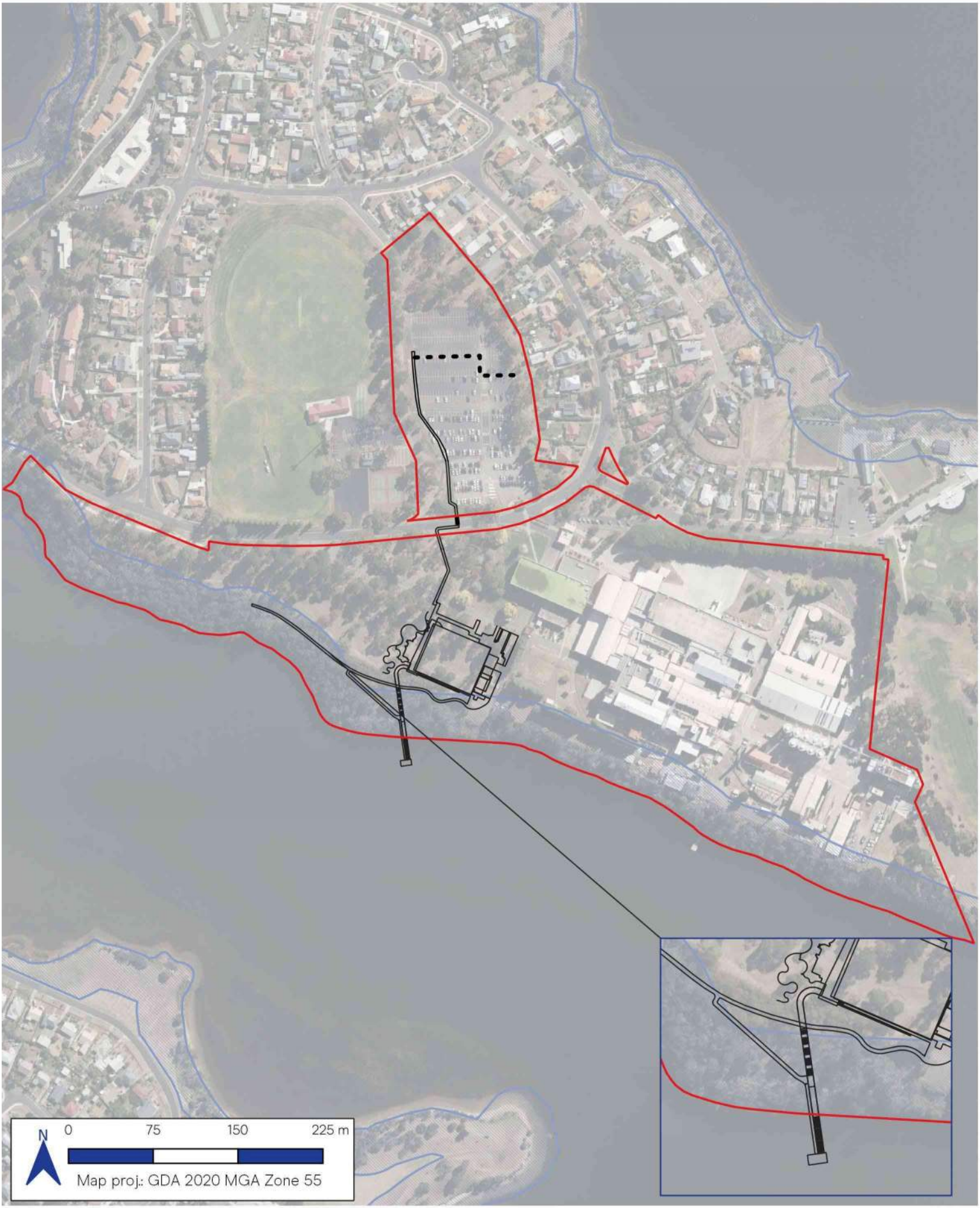
(x) Future Urban Zone;

(xi) Particular Purpose Zone; or

(xii) General Residential Zone or Low Density Residential Zone, only if an application for subdivision.

The Project includes the development of land within a waterway and coastal protection area, as shown in Figure 9. The Project also includes the development of land within a priority vegetation area within the Environmental Management Zone, as shown in Figure 10. The Natural Assets Code therefore applies to the Project.

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Project Site

Proposed development footprint

Tasmanian Planning Scheme Codes

Waterway and Coastal Protection Area Code

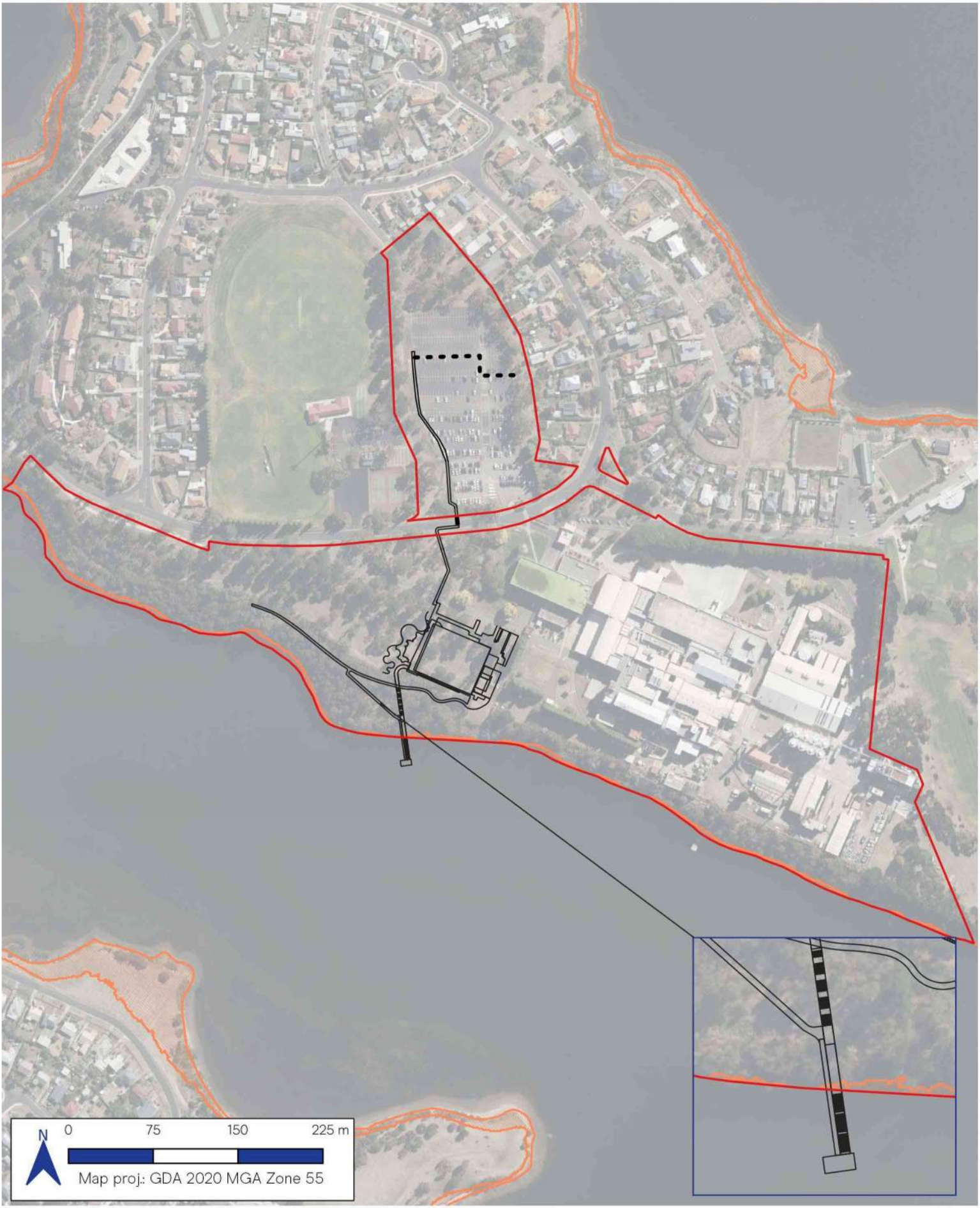
Chocolate Experience at Cadbury

Figure 9
Tasmanian Planning Scheme Codes - Waterway and Coastal Protection Areas Code

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Size A4

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Project Site

Proposed development footprint

Tasmanian Planning Scheme Codes

Future coastal refugia area

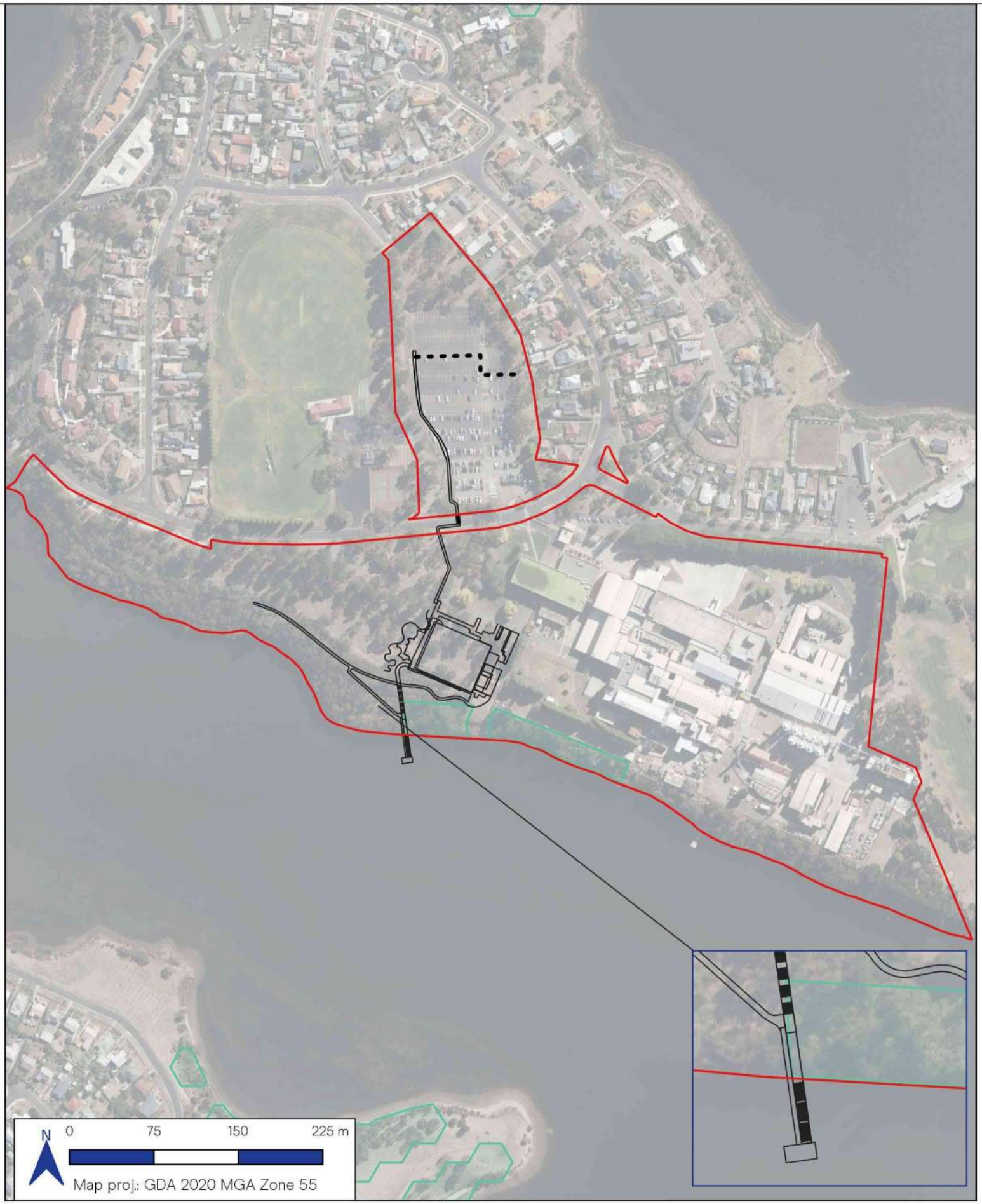
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Figure 10
Tasmanian Planning Scheme Codes - Future Coastal Refugia Area Code

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Date	26 Sep 2025
Size	A4

Document Set ID: 3598180
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Project Site

Proposed development footprint

Tasmanian Planning Scheme Codes

Priority vegetation area

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Figure 11
Tasmanian Planning Scheme Codes - Priority Vegetation Area Code

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11.2 Applicable standards

Table 16 Applicable standards in the Natural Assets Code

Clause		Applicability
Development Standards for Buildings and Works		
Clause C7.6.1 Buildings and works within a waterway and coastal protection area or a future coastal refugia area	A1/P1	Applicable.
	A2/P2	Applicable.
	A3/P3	Applicable.
	A4/P4	Not applicable. No dredging or reclamation proposed.
	A5/P5	Not applicable. No coastal protection works proposed.
Clause C7.6.2 Clearance within a priority vegetation area	A1/P1	Applicable.
Development Standards for Subdivision		
Clause C7.7 Development Standards for Subdivision		Not applicable. No subdivision is proposed.

11.3 Clause C7.6.1 Buildings and works within a waterway and coastal protection area or a future coastal refugia area

Acceptable Solutions	Performance Criteria
Objective	
That buildings and works within a waterway and coastal protection area or future coastal refugia area will not have an unnecessary or unacceptable impact on natural assets.	
A1	**P1.1**
Buildings and works within a waterway and coastal protection area must: (a) be within a building area on a sealed plan approved under this planning scheme; (b) in relation to a Class 4 watercourse, be for a crossing or bridge not more than 5m in width; or (c) if within the spatial extent of tidal waters, be an extension to an existing boat ramp, car park, jetty, marina, marine farming shore facility or slipway that is not more than 20% of the area of the facility existing at the effective date.	Buildings and works within a waterway and coastal protection area must avoid or minimise adverse impacts on natural assets, having regard to: (a) impacts caused by erosion, siltation, sedimentation and runoff; (b) impacts on riparian or littoral vegetation; (c) maintaining natural streambank and streambed condition, where it exists; (d) impacts on in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation; (e) the need to avoid significantly impeding natural flow and drainage; (f) the need to maintain fish passage, where known to exist;

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(g) the need to avoid land filling of wetlands;

(h) the need to group new facilities with existing facilities, where reasonably practical;

(i) minimising cut and fill;

(j) building design that responds to the particular size, shape, contours or slope of the land;

(k) minimising impacts on coastal processes, including sand movement and wave action;

(l) minimising the need for future works for the protection of natural assets, infrastructure and property;

(m) the environmental best practice guidelines in the Wetlands and Waterways Works Manual; and

(n) the guidelines in the Tasmanian Coastal Works Manual.

P1.2

Buildings and works within the spatial extent of tidal waters must be for a use that relies upon a coastal location to fulfil its purpose, having regard to:

(a) the need to access a specific resource in a coastal location;

(b) the need to operate a marine farming shore facility;

(c) the need to access infrastructure available in a coastal location;

(d) the need to service a marine or coastal related activity;

(e) provision of essential utility or marine infrastructure; or

(f) provisions of open space or for marine-related educational, research, or recreational facilities.

Planner Response

A small part of the new CEC building, part of the proposed jetty and the pedestrian connections are in the Waterway and Coastal Protection Area as shown in Figure 9.

The Project does not meet the acceptable solution as there is no building area on the sealed plan and the Timtumili minanya/River Derwent is a Class 1 watercourse. The Project therefore requires assessment against P1.1.

The terrestrial NVA prepared by NBES provides a detailed assessment against the performance criteria. The report concludes the following:

- Impacts from erosion, siltation, sedimentation and runoff can be resolved through an erosion and sedimentation control plan implemented before, during and after construction.
- There is minimal clearing in the Waterway and Coastal Protection area.
- No impacts to natural streambank or streambed conditions are anticipated to occur.
- No impacts to in-stream habitats are anticipated to occur[11].
- The development will not impact natural flow and drainage of any waterways[12].
- No wetlands are impacted.
- The existing project area is largely free of existing infrastructure.

[11] The overlay area relates to the River Derwent however in-stream habitat areas are outside of the overlay area. A separate marine Natural Values Assessment has been prepared by Marine Solutions.

[12] The River Derwent itself is outside of the overlay area.

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- There will be minimal cut and fill.
- The Project is not expected to impact coastal processes.

NBES do advise that all works should be undertaken in accordance with the Tasmanian Coastal Works Manual, and Wetlands and Waterways Works Manual both issued by the Department of Natural Resources and Environment. Compliance with these can be achieved by way of condition relating to the preparation and implementation of the erosion and sedimentation control plan.

The project area does not lie within the spatial extent of tidal waters, as such, P1.2 is not applicable to the Project.

The performance criteria (P1) are satisfied subject to condition.

A2

Buildings and works within a future coastal refugia area must be located within a building area on a sealed plan approved under this planning scheme.

P2.1

Buildings and works within a future coastal refugia area must allow for natural coastal processes to continue to occur and avoid or minimise adverse impacts on natural assets, having regard to:

(a) allowing for the landward transgression of sand dunes and the landward colonisation of wetlands, saltmarshes and other coastal habitats from adjacent areas;

(b) avoiding the creation of barriers or drainage networks that would prevent future tidal inundation;

(c) allowing the coastal processes of sand deposition or erosion to continue to occur;

(d) the need to group new facilities with existing facilities, where reasonably practical;

(e) the impacts on native vegetation;

(f) minimising cut and fill;

(g) building design that responds to the particular size, shape, contours or slope of the land;

(h) the impacts of sea-level rise on natural coastal processes and coastal habitat;

(i) the environmental best practice guidelines in the Wetlands and Waterways Works Manual; and

(j) the guidelines in the Tasmanian Coastal Works Manual.

P2.2

Buildings and works within a future coastal refugia area must be for a use that relies upon a coastal location to fulfil its purpose, having regard to:

(a) the need to access a specific resource in a coastal location;

(b) the need to operate a marine farming shore facility;

(c) the need to access infrastructure available in a coastal location;

(d) the need to service a marine or coastal related activity;

(e) provision of essential utility or marine infrastructure; and

(f) provision of open space or for marine-related educational, research, or recreational facilities.

Planner Response

The proposed jetty transects the Future Coastal Refugia Area overlay as shown in Figure 10.

The Project does not meet the acceptable solution as there is no building area on a sealed plan. The Project therefore requires assessment against P1.1.

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It therefore requires assessment against the performance criteria. The terrestrial Natural Values Assessment prepared by NBES provides a detailed assessment against the performance criteria and concludes:

- No sand dunes, wetlands, or saltmarsh habitats in proximity to works. Coastal fringe within project area characterised by a stable embankment of large rock and boulders. No landward transgression anticipated.
- No barriers will be constructed that affect tidal inundation.
- Natural coastal (riverine) processes for deposition and erosion area anticipated post-construction.
- New construction within an area supporting existing industrial/commercial buildings.
- Minimal impacts to native vegetation are anticipated, particularly in the near coastal/riverside fringe.
- The works will aim to minimise the amount of cut and fill.
- Majority of buildings and works for the project occur outside of the coastal refugia overlay. The primary access from the riverside involves pathway construction within the overlay and will be undertaken in a manner that is sensitive to the local topography and land conditions.
- Sea-level rise is not expected to influence the proposed development to any meaningful degree and will not exacerbate any particular impacts to coastal processes or coastal habitat.
- The environmental best practice guidelines in the *Wetlands and Waterways Works Manual* will be followed; and
- The guidelines in the *Tasmanian Coastal Works Manual* will be followed (through condition of approval).

The performance criteria (P1) are satisfied.

A3	**P3**
Development within a waterway and coastal protection area or a future coastal refugia area must not involve a new stormwater point discharge into a watercourse, wetland or lake.	Development within a waterway and coastal protection area or a future coastal refugia area involving a new stormwater point discharge into a watercourse, wetland or lake must avoid or minimise adverse impacts on natural assets, having regard to: (a) the need to minimise impacts on water quality; and (b) the need to mitigate and manage any impacts likely to arise from erosion, sedimentation or runoff.

Planner Response

There is no new stormwater discharge point into Windermere Bay[13].

The acceptable solution (A1) is met.

11.4 Clause C7.6.2 Clearance within a priority vegetation area

Acceptable Solutions	Performance Criteria

Objective

That clearance of native vegetation within a priority vegetation area:

(a) does not result in unreasonable loss of priority vegetation;

(i) is appropriately managed to adequately protect identified priority vegetation; and

(ii) minimises and appropriately manages impacts from construction and development activities.

[13] While stormwater will be discharged directly to the river environment, it is via an existing legal point of discharge. It should also be noted that roof water will be collected for reuse for irrigation and toilet flushing, water sensitive urban design through rain gardens in the landscape design will be incorporated for external pavements and a new gross pollutant trap will be installed as indicated in the indicative stormwater design prepared by MCG Consult.

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A1 Clearance of native vegetation within a priority vegetation area must be within a building area on a sealed plan approved under this planning scheme.	**P1.1** Clearance of native vegetation within a priority vegetation area must be for: (a) an existing use on the site, provided any clearance is contained within the minimum area necessary to be cleared to provide adequate bushfire protection, as recommended by the Tasmania Fire Service or an accredited person; (b) buildings and works associated with the construction of a single dwelling or an associated outbuilding; (c) subdivision in the General Residential Zone or Low Density Residential Zone; (d) use or development that will result in significant long term social and economic benefits and there is no feasible alternative location or design; (e) clearance of native vegetation where it is demonstrated that on-going pre-existing management cannot ensure the survival of the priority vegetation and there is little potential for long-term persistence; or (f) the clearance of native vegetation that is of limited scale relative to the extent of priority vegetation on the site. **P1.2** Clearance of native vegetation within a priority vegetation area must minimise adverse impacts on priority vegetation, having regard to: (a) the design and location of buildings and works and any constraints such as topography or land hazards; (b) any particular requirements for the buildings and works; (c) minimising impacts resulting from bushfire hazard management measures through siting and fire-resistant design of habitable buildings; (d) any mitigation measures implemented to minimise the residual impacts on priority vegetation; (e) any on-site biodiversity offsets; and (f) any existing cleared areas on the site.

Planner Response

The proposed jetty and pedestrian walkway is partially located in the Priority Vegetation Area as shown in Figure 11.

There is no building area on a sealed plan and therefore the Project does not meet the acceptable solution (A1) ad requires assessment against the performance criteria.

The proposed clearance in the overlay area is minimal and will not result in any removal of large trees. Importantly the one large habitat tree within the overlay area will be retained and its tree protection zone will not be impacted as shown in Figure 2 of the NBES NVA.

The clearance of native vegetation within a priority vegetation area is for a use and development that will result in significant long term social and economic benefits. There is no feasible alternative location or design of the jetty and walkway due to topographical, environmental and cultural heritage constraints.

Performance criteria P1.2 is also not applicable as there is no vegetation within the priority vegetation area that meets the definition of priority vegetation in Clause 7.3.1; thus, there is no chance of any adverse impact to priority vegetation.

The performance criteria (P1) are satisfied.

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12 Coastal Erosion Hazard Code

12.1 Application of code

The Project includes use and development within a low coastal erosion hazard band, as shown in Figure 12.

Excluding where development occurs on an actively mobile landform in the coastal zone, the following use or development is exempt from this code:

(a) use or development that is building work or plumbing work as defined in the Building Act 2016, excluding:

(i) a critical use, hazardous use, or vulnerable use;

(ii) if located within a high coastal erosion hazard band; or

(iii) coastal protection works;

The proposed use and development within the coastal erosion hazard area is not for a critical use, hazardous use or vulnerable use. It is not located within a high coastal erosion hazard band, it is not for coastal protection works, and it is not on an actively mobile landform.

The Coastal Erosion Hazard Assessment Report prepared by Pitt & Sherry confirms the above.

The Project is exempt from the Coastal Erosion Hazard Code pursuant to clause C10.4.1 (a) of the planning scheme. No further assessment against the provisions of the Coastal Erosion Hazard Code is required.

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Project Site

Proposed development footprint

Tasmanian Planning Scheme Codes

Coastal Erosion Hazard Code

Chocolate Experience at Cadbury

Figure 12
Tasmanian Planning Scheme Codes - Coastal Erosion Hazard Code

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Job No.	2425-096
Rev.	Rev D
Date	26 Sep 2025
Size	A4

Document Set ID: 3598180
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13 Coastal Inundation Hazard Code

13.1 Application of the code

The Coastal Inundation Hazard Code applies to use and development of land within a coastal inundation hazard area.

The Project includes the use and development of land within a medium coastal inundation hazard band, as shown in Figure 13. The Coastal Inundation Hazard Code therefore applies to this Project.

13.2 Applicable standards

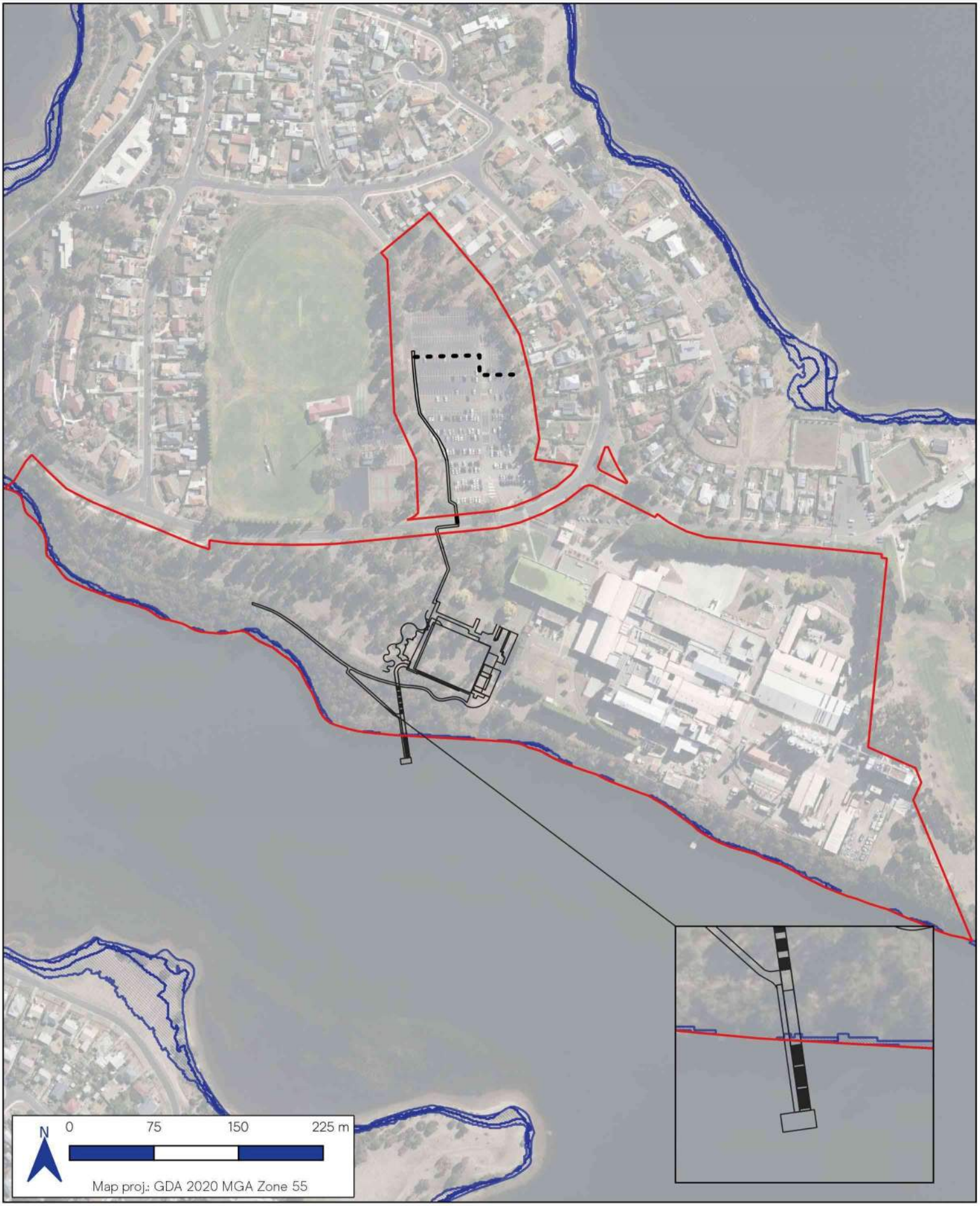
Table 17 Applicable standards in the Coastal Inundation Hazard Code

Clause		Applicability
Use Standards		
Clause C11.5.1 Uses within a high coastal inundation hazard band	A1/P1	Not applicable. No uses within a high coastal inundation hazard band proposed.
Clause C11.5.2 Uses located within a non-urban zone and within a medium coastal inundation hazard band	A1/P1	Applicable.
Clause C11.5.3 Uses located within a non-urban zone and within a low coastal inundation hazard band	A1/P1	Not applicable. No uses within a low coastal inundation hazard band proposed.
Clause C11.5.4 Critical use, hazardous use or vulnerable use	A1/P1	Not applicable. No critical use, hazardous use or vulnerable use proposed.
	A2/P2	Not applicable. No critical use, hazardous use or vulnerable use proposed.
	A3/P3	Not applicable. No critical use, hazardous use or vulnerable use proposed.
	A4/P4	Not applicable. No critical use, hazardous use or vulnerable use proposed.
Development Standards for Buildings and Works		

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Clause		Applicability
Clause C11.6.1 Buildings and works, excluding coastal protection works, within a coastal inundation hazard area	A1/P1	Applicable.
Clause C11.6.2 Coastal protection works within a coastal inundation hazard area	A1/P1	Not applicable. No coastal protection works proposed.
Development Standards for Subdivision		
Clause 11.7 Development Standards for Subdivision		Not applicable. No subdivision proposed.

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Project Site

Proposed development footprint

Tasmanian Planning Scheme Codes

Coastal Inundation Hazard Code

Chocolate Experience at Cadbury

Figure 13
Tasmanian Planning Scheme Codes - Coastal Inundation Hazard Code

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Size A4

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13.3 Clause C11.5.2 Uses located within a non-urban zone and within a medium coastal inundation hazard band

Acceptable Solutions	Performance Criteria

Objective

To ensure that a use located within a non-urban zone and within a medium coastal inundation hazard band:

(a) is reliant on a coastal location; and

(b) can achieve and maintain a tolerable risk from exposure to coastal inundation.

A1 No Acceptable Solution.	**P1.1** A use within a non-urban zone and within a medium coastal inundation hazard band must be for a use which relies upon a coastal location to fulfil its purpose, having regard to: (a) the need to access a specific resource in a coastal location; (b) the need to operate a marine farming shore facility; (c) the need to access infrastructure available in a coastal location; (d) the need to service a marine or coastal related activity; (e) provision of an essential utility or marine infrastructure; (f) provision of open space or for marine-related educational, research, or recreational facilities; (g) any advice from a State authority, regulated entity or a council; and (h) the advice obtained in a coastal inundation hazard report. **P1.2** A coastal inundation hazard report also demonstrates that: (a) any increase in the level of risk from coastal inundation does not require any specific hazard reduction or protection measures; or (b) the use can achieve and maintain a tolerable risk from a 1% annual exceedance probability coastal inundation event in 2100 for the intended life of the use without requiring any specific hazard reduction or protection measures.

Planner Response

There is no acceptable solution. The Project must therefore be assessed against the performance criteria.

The Coastal Inundation Hazard Assessment Report prepared by pitt&sherry provides a detailed assessment against the performance criteria.

The report demonstrates that the Project meets P1.1 as the proposed development within the medium coastal inundation hazard band is for a jetty for the use of berthing a ferry vessel to support transport of visitors to and from the site. The Project therefore relies on the coastal location to fulfil its purpose.

The report demonstrates that the Project meets P1.2 as any increase in the level of risk from coastal inundation does not require any specific hazard reduction or protection measures; and the proposed use can achieve and maintain a tolerable risk from a 1% annual exceedance probability coastal inundation event in 2100 for the intended life of the use without requiring any specific hazard reduction or protection measures.

The performance criteria (P1) are satisfied.

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13.4 Clause C11.6.1 Buildings and works, excluding coastal protection works, within a coastal inundation hazard area

Acceptable Solutions	Performance Criteria

Objective

That:

(a) building and works, excluding coastal protection works, within a coastal inundation hazard area, can achieve and maintain a tolerable risk from coastal inundation; and

(b) buildings and works do not increase the risk from coastal inundation to adjacent land and public infrastructure.

A1 No Acceptable Solution.	**P1.1** Buildings and works, excluding coastal protection works, within a coastal inundation hazard area must have a tolerable risk, having regard to: (a) whether any increase in the level of risk from coastal inundation requires any specific hazard reduction or protection measures; (b) any advice from a State authority, regulated entity or a council; and (c) the advice contained in a coastal inundation hazard report. **P1.2** A coastal inundation hazard report also demonstrates that the building or works: (a) do not cause or contribute to coastal inundation on the site, on adjacent land or public infrastructure; and (b) can achieve and maintain a tolerable risk from a 1% annual exceedance probability coastal inundation event in 2100 for the intended life of the use without requiring any specific coastal inundation protection works.

Planner Response

There is no acceptable solution. The Project must therefore be assessed against the performance criteria.

The Coastal Inundation Hazard Assessment Report prepared by Pitt & Sherry provides a detailed assessment against the performance criteria.

The report demonstrates that P1.1 is met as any increase in the level of risk from coastal inundation does not require any specific hazard reduction or protection measures, and the proposed development can achieve and maintain a tolerable risk from coastal inundation.

The report demonstrates that P1.2 is met as the Project does not cause or contribute to coastal inundation on the site, on adjacent land or public infrastructure, and can achieve and maintain a tolerable risk from a 1% annual exceedance probability coastal inundation event in 2100 for the intended life of the use without requiring any specific coastal inundation protection works.

The performance criteria (P1) are satisfied.

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14 Flood-Prone Areas Hazard Code

14.1 Application of the code

The Flood-Prone Areas Hazard Code applies to development of land within a flood-prone area. The Project includes some minor ancillary development within a flood-prone area, as shown in Figure 14. Specifically, the development within the flood-prone area is for the creation of a new pedestrian walkway and wombat crossing on Cadbury Road, that serves as a connection between the car park and the CEC building.

14.2 Applicable codes

Table 18 Applicable standards in the Flood Prone Area Hazard Code

Clause		Applicability
Use Standards		
C12.5 Use Standards		Not applicable. The code does not apply to the proposed use.
Development Standards for Buildings and Works		
C12.6.1 Buildings and works within a flood-prone hazard area	A1/P1	Applicable.
Development Standards for Subdivision		
C12.7.1 Subdivision within a flood-prone hazard area		Not applicable. No subdivision proposed.

14.3 Clause C12.6.1 Buildings and works within a flood-prone hazard area

Acceptable Solutions	Performance Criteria

Objective

That:

(a) building and works within a flood-prone hazard area can achieve and maintain a tolerable risk from flood; and

(b) buildings and works do not increase the risk from flood to adjacent land and public infrastructure.

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A1 No Acceptable Solution.	**P1.1** Buildings and works within a flood-prone hazard area must achieve and maintain a tolerable risk from a flood, having regard to: (a) the type, form, scale and intended duration of the development; (b) whether any increase in the level of risk from flood requires any specific hazard reduction or protection measures; (c) any advice from a State authority, regulated entity or a council; and (d) the advice contained in a flood hazard report. **P1.2** A flood hazard report also demonstrates that the building and works: (a) do not cause or contribute to flood on the site, on adjacent land or public infrastructure; and (b) can achieve and maintain a tolerable risk from a 1% annual exceedance probability flood event for the intended life of the use without requiring any flood protection measures.

Planner Response

There is no acceptable solution. The Project must be assessed against the performance criteria.

The development within the flood-prone area is limited to minor works to delineate a pedestrian walkway within an existing hardstand area (i.e. fencing, bollards and line painting), a new wombat crossing across Cadbury Road and landscaping works for the creation of a new walkway.

The flood prone areas relevant do not arise from riverine flooding but rather pooling of water in low lying areas. The risk from flooding in this area is sufficiently low that while shown on the planning scheme overlay maps it has been removed from Council's flood maps available from https://maps.gcc.tas.gov.au/connect/analyst/mobile/#/main?mapcfg=Flooding. The Project is also not affected by any flooding areas identified in the latest mapping prepared by the State Emergency Service which is available on LISTMap.

The proposed works are very minor in scale and similar in nature to 'minor utilities' which are otherwise exempt from the code. The works will obviously not impact existing hazard levels or risk experienced during a flood event and a flood hazard report should be considered unnecessarily given the status of Council's separate flood maps.

The performance criteria (P1) are satisfied.

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Project Site

Proposed development footprint

Tasmanian Planning Scheme Codes

Flood-prone areas

Chocolate Experience at Cadbury

Figure 14
Tasmanian Planning Scheme Codes - Flood-prone Hazard Areas Code

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Job No.	2425-096
Rev.	Rev D
Date	26 Sep 2025
Size	A4

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

15 Potentially Contaminated Land Code

15.1 Application of the code

The Potentially Contaminated Land Code applies to development on land that:

(d) has been identified as having been used, or may have been used, for a potentially contaminating activity, or as land onto which it is likely that contamination from a potentially contaminating activity has migrated:

(i) in a report lodged with the application; or

(ii) in a report prepared by a site contamination practitioner in response to a request under section 54 of the Act.

The Potentially Contaminated Land Code applies to this Project, as demonstrated in the Environmental Site Assessment prepared by Pitt & Sherry.

15.2 Applicable standards

Table 19 Applicable standards in the Potentially Contaminated Land Code

Clause		Applicability
Use Standards		
C14.5.1 Suitability for intended use	A1/P1	Not applicable. Project is not for a sensitive use or a specified use listed in Table C14.1.
Development Standards for Buildings and Works		
C14.6.1 Excavation works, excluding land subject to the Macquarie Point Development Corporation Act 2012	A1/P1	Applicable.
C14.6.2 Redevelopment on land subject to the Macquarie Point Development Corporation Act 2012	A1/P1	Not applicable. Land is not subject to the *Macquarie Point Development Corporation Act 2012.*
Development Standards for Subdivision		
C14.7 Development Standards for Subdivision		Not applicable. No subdivision proposed.

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15.3 Clause C14.6.1 Excavation works, excluding land subject to the Macquarie Point Development Corporation Act 2012

Acceptable Solutions	Performance Criteria

Objective

That works involving excavation of potentially contaminated land, excluding on land subject to the *Macquarie Point Development Corporation Act 2012*, do not adversely impact on human health or the environment.

A1	P1
Excavation, excluding on land subject to the *Macquarie Point Development Corporation Act 2012*, must involve less than 250m³ of site disturbance.	Excavation, excluding on land subject to the *Macquarie Point Development Corporation Act 2012*, must not have an adverse impact on human health or the environment, having regard to: (a) an environmental site assessment that demonstrates there is no evidence the land is contaminated; (b) an environmental site assessment that demonstrates that the level of contamination does not present a risk to human health or the environment; or (c) an environmental site assessment, including a plan to manage contamination and associated risk to human health and the environment, that includes: (i) any specific remediation and protection measures required to be implemented before excavation commences; and (ii) a statement that the excavation does not adversely impact on human health or the environment.

Planner Response

The Project will involve more than 250m³ of site disturbance and therefore the acceptable solution (A1) is not met.

An Environmental Site Assessment has been prepared by Pitt & Sherry including a plan to manage contamination and associated risk to human health and the environment. The report concludes:

- Fill material is present throughout the site and while posing potential aesthetic and structural risks for the project, contaminants are within the expected range for natural soils.
- While residual ballast on site from the former rail line is likely present, contaminants are likely to be present at acceptable levels.
- Onsite waste materials arising from site construction is likely to be classified as Level 2 – low level contaminated soils and can be re-used on site.
- Overall, there is no unacceptable level of risk.

The performance criteria (P1) are satisfied.

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16 Landslip Hazard Code

16.1 Application of the code

The Landslip Hazard Code applies to:

a. use or development of land within a landslip hazard area; or

(iii) use or development of land identified in a report, that is lodged with an application, or required in response to a request under section 54 of the Act, as having potential to cause or contribute to a landslip.

The Project includes the use and development of land within a landslip hazard area (medium risk), as shown in Figure 15. The Landslip Hazard Code therefore applies to this Project.

16.2 Applicable standards

Table 20 Applicable standards in the Landslip Hazard Code

Clause		Applicability
Use standards		
C15.5 Use Standards		Not applicable. Use exempt pursuant to C15.4.1 (a).
Development Standards for Buildings and Works		
C15.6.1 Building and works within a landslip hazard area	A1/P1	Applicable.
Development Standards for Subdivision		
C15.7 Development Standards for Subdivision		Not applicable. No subdivision proposed.

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Project Site

Proposed development footprint

Tasmanian Planning Scheme Codes

Landslip Hazard Area

Chocolate Experience at Cadbury

Figure 15
Landslip Hazard Code

era

Job No.	2425-096
Rev.	Rev B
Date	26 Sep 2025
Size	A4

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16.3 C15.6.1 Building and works within a landslip hazard area

Acceptable Solutions	Performance Criteria

Objective

That building and works on land within a landslip hazard area can:

(a) minimise the likelihood of triggering a landslip event; and

(b) achieve and maintain a tolerable risk from a landslip.

A1 No Acceptable Solution.	**P1.1** Building and works within a landslip hazard area must minimise the likelihood of triggering a landslip event and achieve and maintain a tolerable risk from landslip, having regard to: (a) the type, form, scale and intended duration of the development; (b) whether any increase in the level of risk from a landslip requires any specific hazard reduction or protection measures; (c) any advice from a State authority, regulated entity or a council; and (d) the advice contained in a landslip hazard report. **P1.2** A landslip hazard report also demonstrates that the buildings and works do not cause or contribute to landslip on the site, on adjacent land or public infrastructure. **P1.3** If landslip reduction or protection measures are required beyond the boundary of the site the consent in writing of the owner of that land must be provided for that land to be managed in accordance with the specific hazard reduction or protection measures.

Planner Response

There is no acceptable solution. Assessment against the performance criteria is therefore required.

A slope stability report (equivalent to a landslide hazard report) prepared by Pitt & Sherry demonstrates that the proposed development satisfies P1.1 for the following reasons:

- The foundations for the proposed CEC are outside the landslide hazard zones, as is the majority of the walkway. These are intended to be permanent structures.
- The rockfall hazard associated with the construction of the jetty and walkway is likely to be managed by scaling. The resultant risk if such measures are planned and executed appropriately will be tolerable, and this risk level will be able to be maintained.
- No advice has been provided by a State authority, regulated entity or a council.
- The advice contained in this landslip hazard report can be considered by the planning authority.

The proposed works do not cause or contribute to landslip on the site, on adjacent land or public infrastructure because there is shallow rock interpreted that can provide suitable founding for construction of the proposed structures. No steepening of the existing slope would be undertaken and therefore the likelihood of instability does not increase. Therefore, the Project satisfies P1.2.

As no landslip reduction or protection measures are required beyond the boundary of the site, P1.3 is not applicable.

The performance criteria (P1) are satisfied.

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17 Conclusion

This planning application seeks approval to establish a new tourism operation 'Chocolate Experience at Cadbury' (CEC) in the existing parklands of the existing Cadbury chocolate factory site at 100 Cadbury Road, Claremont. The site is owned by Cadbury Schweppes Pty Ltd (now known as Mondelēz Australia) and is located on the Cadbury Peninsula overlooking Windermere Bay, part of the Timtumili minanya/River Derwent.

The CEC is a purpose-built, multi-level visitor attraction that combines immersive chocolate experiences, food and beverage offerings, and family-friendly amenities.

The CEC will comprise a new three storey building with supporting infrastructure including new and upgraded pedestrian paths, upgraded car parking access, landscaping and wayfinding. A new jetty to Windermere Bay is a critical new piece of infrastructure, with boat transport via the Timtumili minanya/River Derwent serving as the primary arrival method for visitors[14].

The Project represents a new and reimagined way for visitors to once again experience chocolate making and the history of the site, but in a way that represents a uniquely Tasmanian experience and meets Mondelēz's operational requirements for separation between industrial and visitor experience areas.

The proposed development is a considered and respectful response to the site and its historical significance. It draws on the site's industrial characteristics using a functional but contemporary design response, with building height and siting responsive to existing built form, setbacks and alignment to Windermere Bay. The location of the new building and the proposed landscape design response retains the 'building in landscape' characteristics, the predominance of the parkland from Cadbury Road, and the vegetation edges to the bay. The proposed development continues the design traditions historically established on the peninsula through its cultural heritage, and the more recent Quaker traditions and Garden City principles which are embodied in the site's historic heritage significance.

An assessment against all relevant standards of the planning scheme is contained in section 5 through to section 16. The Project is for a discretionary use within the applicable zones (including by way of the Cadbury Visitor Experience Specific Area Plan). The uses are however considered to be consistent with applicable zone and SAP purpose statements.

In addition, a total of 45 different use and development standards are applicable to the Project. The relevant standards and whether the Project complies with the acceptable solution or relies on the performance criteria is outlined in Table 20.

Table 21 Summary of the applicable standards and whether the Project relies on the AS or PC

[14] Tickets to enter the experience will include boat transport to and from Sullivans Cove.

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Clause	Standard	AS or PC
Cadbury Visitor Experience Specific Area Plan		
GLE-S15.6.1 (A1/P1)	Cadbury visitor experience impact	Complies with AS
GLE-S15.6.1 (A2/P2)	Cadbury visitor experience impact	Complies with AS
GLE-S15.6.1 (A3/P3)	Cadbury visitor experience impact	Complies with AS
GLE S15.7.1	Siting of buildings, structures and landscape elements	Relies on PC
Light Industrial Zone		
18.3.1 (A1/P1)	Hours of operation	Complies with AS
18.3.1 (A2/P2)	Lighting	Complies with AS
18.3.1 (A3/P3)	Commercial vehicle movements	Complies with AS
18..3.2	Discretionary uses	Relies on PC
General Industrial Zone		
19.3.1	Discretionary uses	Relies on PC
19.4.1	Building height	Complies with AS
19.4.2	Setback	Complies with AS
19.4.3	Landscaping	Complies with AS
Environmental Management Zone		
23.4.1	Discretionary uses	Relies on PC
23.4.2 (A1/P1)	Building height, setback and siting	Relies on PC
23.4.2 (A2/P2)	Building height, setback and siting	Relies on PC
23.4.3	Exterior finish	Complies with AS
23.4.4	Vegetation management	Relies on PC
Parking and Sustainable Transport Code		
C2.5.1	Car parking numbers	Relies on PC
C2.5.2	Bicycle parking numbers	Complies with AS
C2.5.3	Motorcycle parking numbers	Relies on PC
C2.5.4	Loading bays	Complies with AS

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Clause	Standard	AS or PC
C2.6.1	Construction of parking areas	Complies with AS
C2.6.2	Design and layout of parking areas	Complies With AS
C2.6.3	Number of accesses for vehicles	Complies with AS
C2.6.5	Pedestrian access	Complies with AS
C2.6.6 (A1/P1)	Loading bays	Complies with AS
C2.6.6 (A2/P2)	Loading bays	Complies with AS
Road and Railway Assets Code		
C3.5.1	Traffic generation at a vehicle crossing, level crossing or new junction	Relies on P1
Local Historic Heritage Code		
C2.6.2	Site coverage	Relies on PC
C2.6.3	Height and bulk of buildings	Relies on PC
C6.6.9	Driveways and parking for non-residential purposes	Relies on PC
C6.6.10	Removal, destruction or lopping of trees, or removal of vegetation, that is specifically part of a local heritage place.	Relies on PC
Natural Assets Code		
C7.6.1 (A1/P1)	Buildings and works within a waterway and coastal protection area or a future coastal refugia area	Relies on PC
C7.6.1 (A2/P2)	Buildings and works within a waterway and coastal protection area or a future coastal refugia area	Relies on PC
C7.6.1 (A3/P3)	Buildings and works within a waterway and coastal protection area or a future coastal refugia area	Relies on PC
C7.6.2	Clearance within a priority vegetation area	Relies on PC
Coastal Inundation Hazard Code		
C11.5.1	Uses within a high coastal inundation hazard band	Relies on PC
C11.5.2	Uses located within a non-urban zone and within a medium coastal inundation hazard band	Relies on PC
C11.6.1	Buildings and works, excluding coastal protection works, within a coastal inundation hazard area	Relies on PC

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Clause	Standard	AS or PC
Flood Prone Areas Hazard Code		
C12.6.1	Buildings and works within a flood-prone hazard area	Relies on PC
Potentially Contaminated Land Code		
C14.6.1	Excavation works, excluding land subject to the Macquarie Point Development Corporation Act 2012	Relies on PC
Landslip Hazard Code		
C15.6.1	Building and works within a landslip hazard area	Relies on PC

Overall, the proposal is considered acceptable under the applicable planning scheme standards and should be approved subject to conditions.

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DATE REPORT PREPARED:26/11/2025

LOCATION: Cadbury service road. Claremont, Tasmania.

REPORT PREPARED FOR: Gallagher Jeffs

REPORTING ARBORIST: Stewart Malone

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10. Limitations of Liability

Appendix A – Arborist Statement

Appendix B – Council RFI

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1. **Executive Summary**

Cadbury Access Road Succession Planting Plan

This document outlines the strategic plan for the phased removal of the existing mature Radiata Pine (Pinus radiata) avenue along the Cadbury factory access road and its replacement with a new avenue of Tulip Trees (Liriodendron tulipifera). The plan aims to manage this transition with minimal disruption while enhancing the long-term aesthetic, ecological, and safety values of the site.

1. Project Rationale

The existing Pinus radiata trees, while providing a mature avenue aesthetic, are reaching the end of their viable lifespan in this context and present several challenges:

Safety Risks: Mature pines can pose risks due to potential branch failure and excessive cone production especially in proximity to an active access road.

Environmental Concerns: Pinus radiata is a known invasive species in many parts of Australia and can outcompete native vegetation and acidify soil with needle drop.

Species Suitability: The current species is a production forestry tree, less suited to a permanent ornamental avenue where long-term amenity is the primary goal.

The Liriodendron tulipifera (Tulip Tree) has been selected as the replacement species due to its:

Aesthetic Appeal: Provides a distinct, ornamental appearance with unique flowers and foliage.

Growth Habit: A large, long-lived deciduous tree that offers significant canopy cover and shade benefits in a suitable location.

Suitability: Well-suited to avenue planting where a consistent, managed form is desired.

2. Staged Implementation Strategy

A staged replacement program is recommended, rather than a single clear-felling operation, to ensure continuous canopy cover and minimise visual impact.

3. Key Considerations and Mitigation

Site Constraints: Management of existing infrastructure (roads, underground services, nearby buildings) requires careful planning for both tree removal and new planting to avoid conflicts.

Establishment Period: The transition period will require careful management as the

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Liriodendron tulipifera (a hardwood/deciduous species) may have a different initial growth rate and form compared to the fast-growing Pinus radiata.

Stakeholder Engagement: Continuous communication with Cadbury management, staff, and relevant local authorities will be crucial to manage expectations and ensure minimal disruption to access road operations.

2. **Inspection Methodology**

A visual ground-based tree assessment was conducted.

3. **Inspection Date**

25/11/2025

4. **Arborist Conducting/Contributing to Assessment**

Name of Arborist: ***Stewart Malone***

Organisation/Company: ***ARBSCAPE***

Qualifications: ***Diploma of Horticulture (Arboriculture), Visual tree risk assessor (QTRA, TRAQ)***

Contact Detail:

Mobile: Stewart Malone, Arborist, 0416 064 837

5. **Site Location**

Cadbury service road. Claremont, Tasmania.

6. **Notes and Observations**

Soil PH: 4 Acidic.

Moisture: 3 Dry.

Root Area Index avg. 0.1m²/m² - 10%.

Tree spacing, centre of trunks. 12m

New planting could be placed at 6m intervals (halfway) between pines. A planting area of 2m/2m could be dug out to a depth of .5m. with all pine roots removed from this area, cut clean by an arborist to insure minimal disruption to pine trees. Soil removed from new planting bed, and new soil added to the bed. The new soil will eliminate the impact the pines have had on the acidification of the surrounding soil. water systems could be added to the new planting areas and mulch (not conifer-based mulch) should be added once trees have been planted to reduce moisture loss and add soil biomass to the areas around the new plantings. Root barrier 500mmm could be added to the outer edge of the new planting areas to stop the pine tree roots from entering.

Lateral canopy reduction of the existing pine trees over the new trees should be undertaken prior to new trees being planted to increase available light and minimise potential

damage to the new plantings. Dead wood removal from the pine trees should also occur at this time, dead wood removal will help protect the new plantings from potential snap-outs and assist assessing arborists when monitoring pine tree dieback rates.

7. Recommendations

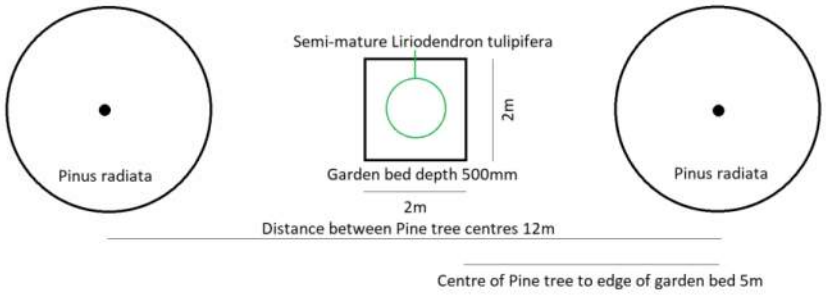
A successful succession plan requires staggering the planting and removal of trees over time to ensure a continuous avenue character. The following is a plan for interplanting mature radiata pines with Liriodendron tulipifera (tulip trees):

Phase 1: Site Assessment and Initial Planting (Years 0-2)
Assess the existing radiata pines: Inspect all mature pines for health, structural integrity, and useful life expectancy (ULE). Trees in poor condition should be removed immediately.
Prepare planting sites:
The existing pines are at 12m spacings. Plant the new Liriodendron trees exactly halfway between the existing pines (at 6m intervals) to create a denser, initial avenue alignment.
Planting beds 2m/2m, cut pine roots with clean, sharp pruning tools within the new panting bed, remove soil and add new topsoil.
Amend the soil with organic matter and improve drainage if necessary to encourage strong root development, as tulip trees prefer deep, rich, moist, well-drained, slightly acidic soil.
Ensure the new trees are planted in a location that receives full sun, as Liriodendron performs best with high light exposure.
Plant and establish Liriodendron: Plant the new tulip trees, water them thoroughly, and apply mulch to retain moisture.
Implement an ongoing maintenance plan:
Establish a regular watering regime for the young Liriodendron, especially during their first three years, to ensure establishment and mitigate competition for water with the mature pines.
Implement an essential weed control program around the new plantings.
Regularly inspect both the mature pines and young tulip trees for pests, diseases, and general health.

Phase 2: Growth Monitoring and Management (Years 3-10)
Monitor competition: Observe the growth rates of both species. Radiata pines are fast-growing and may outcompete the young tulip trees for light and resources if left unchecked.
Pruning and canopy management:
Prune lower branches of the mature pines as needed to increase light penetration to the Liriodendron below.
Formatively prune the young Liriodendron to establish a strong central leader and good

branch structure, suitable for an avenue tree.
Staggered removal (selective thinning): Begin a phased removal of the mature radiata pines as the Liriodendron grow and begin to form a recognizable avenue. This should be a gradual process, removing the poorest-condition pines first. This prevents the shock of a clear-cut and ensures continuous canopy cover.
Pinus radiata does not reshoot after being cut below all green material, so stump treatment is not typically required if cut correctly.

Phase 3: Maturation of Liriodendron (Years 10+)
Final removal: The remaining mature pines can be removed once the Liriodendron have developed sufficient size and canopy to define the avenue and provide the desired aesthetic and environmental functions (e.g., shade).
Ongoing Liriodendron management: The Liriodendron tulipifera have a potential mature width of 10–15m and should eventually be spaced 10–12m apart for a consistent formal avenue layout. The staggered removal plan aligns with this longer-term spacing objective.



8. **Impact Statement**

Benefits of Succession Planting.

Maintains Continuous Canopy: Succession planting ensures a steady supply of maturing trees to take the place of senescent ones, thus avoiding gaps in the tree canopy. This preserves the avenue's visual appeal and the shade, cooling effects, and aesthetic value that mature trees provide.

Preserves Environmental Benefits: Mature trees offer numerous ecological services, including carbon sequestration, improved air quality, noise reduction, and essential habitats for wildlife. A gradual replacement plan ensures these benefits are not lost all at once.

Minimizes Disruption: Removing all trees simultaneously creates a stark, barren landscape. Staggered replacement minimizes this visual and environmental void, leading to less negative public reaction and a smoother transition.

Reduces Risk of Failure: Planting a large number of young trees at once can be risky, as new saplings are highly susceptible to transplant shock, water stress, pests, and vandalism. Staggering the process and using proactive maintenance increases the overall survival rate of the new generation.

Challenges of Removing All at Once

Aesthetic Void: A clear-felled avenue is a significant visual loss that can take decades to recover from, as young trees need time to reach maturity.

Loss of Function: Immediate removal results in the temporary loss of all associated environmental benefits, such as shade, which can increase urban heat and reduce comfort.

Soil Issues: Removing all existing trees, including their extensive root systems, can disrupt soil structure and nutrient levels. It can take months for the ground to be suitable for replanting, and even then, new trees may struggle with the remnants of the old root systems.

Public Opposition: Felling many mature trees at once is often an emotive and controversial issue that requires extensive public relations to manage effectively.

9. **Conclusion**

This succession planting plan offers a proactive approach to managing the end-of-life cycle of the current tree avenue. By replacing the Pinus radiata with Liriodendron tulipifera through a thoughtful, phased process, Cadbury can ensure a safe, attractive, and sustainable tree-lined access road for the future.

10. **Limitations of Liability**

ARBSCAPE has prepared this report utilizing the services of a qualified and certified professional arborist. The conclusions and recommendations contained in this report are provided to the client with the following understanding:

That the inspection was limited to visual examination, without dissection, excavation, probing or coring. There is no warranty or guarantee expressed or implied, that problems or deficiencies of the subject tree(s) may not arise in the near future.

ARBSCAPE has developed the conclusions and recommendations in this report without bias, acting on the information provided by the client prior to, and/or at the time of the inspection. The client may accept or disregard the recommendations of this report should they so wish.

This report is to be utilized in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions or recommendations made in this report, may only be used where the whole of the original report (or copy) is referenced in, and directly attached to that submission, report or presentation.

Information contained in this report covers only those trees which were examined and reflects the condition of those trees at the time of inspection as noted in this report.

Appendix A – Arborist Statement

I Stewart Malone, hereby certify that the information contained within this report, is to the best of my knowledge, a true and accurate representation of the subject specimen's overall condition and health, and subsequent recommendations at the time of this assessment.

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Appendix B – Council RFI.

Council Request

e) Can Liriodendron tulipifera succession plantings be accommodated between established Pinus radiata trees without adversely impacting the remaining landscape life of the pines (noting the 12m radius TPZ and 3.4m SRZ applicable to each)?

Response:

- The plan recommends interplanting new Liriodendron tulipifera trees exactly halfway between the existing Pinus radiata (at 6m intervals), ensuring that the new plantings do not encroach on 3.4m Structural Root Zone (SRZ) of the mature pines. The 12m Tree Protection Zone (TPZ) will be impacted by the installation of new garden beds and as a result some decline in tree vitality and overall health of the Pinus would be expected. The Pinus would be annually monitored during the succession plan, documenting growth and dieback rates, risk mitigation pruning requirements and required pruning for light penetration for new plantings.
- Planting beds are to be dug out to a depth of 0.5m, with all pine roots removed from the area and cut clean by an arborist. Roots must not be lifted or snapped by excavation tools. Root cut points must be outside of the SRZ. SZR to be clearly marked out for each tree prior to digging new planting beds. This careful root management is designed to minimise adverse impacts on the remaining landscape life of the pines.
- The plan also calls for lateral canopy reduction and dead wood removal from the pines prior to new tree planting, which will increase available light for the new plantings and reduce potential damage. Ongoing monitoring and maintenance of the pines will benefit both new and old plantings.
- The succession plan will priorities the new plantings health and establishment needs, this will have negative effects on the pines initially (root disruption during the initial planting period) however as the pines recover from the root damage the ongoing maintenance and monitoring that will be required for the rest of their useful life will allow arborists to keep these trees to the highest possible health and safety standards whilst still prioritising the Liriodendron establishment.

f) Can Liriodendron tulipifera be successfully established among the Cadbury era Pinus radiata trees, with specific reference to available space, soil profile/PH, and competition for light? Please provide a specification for successful establishment.

Response:

- **Available Space:** The avenue's existing spacing (12m between pines) allows for new Liriodendron plantings at 6m intervals, creating a denser, initial alignment without overcrowding. The edge of the new planting beds will be 5m from the pines which allows for a maintainable SRZ 3.4m. The encroachment into the TPZ is relatively small in area however root damage is expected.
- **Soil Profile/PH:** The soil is currently acidic pH 4. The plan specifies removing soil from the new planting beds and replacing it with new topsoil, which will mitigate acidification and provide a suitable substrate for Liriodendron establishment. Tulip trees prefer deep, rich, moist, well-drained, slightly acidic soil, so amending with organic matter and improving drainage is recommended. Root control barrier should be installed to As the Liriodendron's mature, root control barriers will need to be removed as the Liriodendron's mature.
- **Competition for Light:** Lateral canopy reduction of the pines and formative pruning of the young Liriodendron will ensure adequate light penetration and healthy growth. Annual pruning of the pines will ensure light penetration to the new plantings is maintained. Corrective/formative pruning of Liriodendron's annually to maintain correct branch structure.

i. A specification for the successful establishment of L. Tulipfera in the Cadbury parklands site environment.

- Plant new Liriodendron tulipifera at 6m intervals between pines.
- Prepare 2m x 2m planting beds, removing pine roots and old soil, replacing with new topsoil.
- Amend soil with organic matter and ensure good drainage.
- Water thoroughly after planting and apply mulch (not conifer-based) to retain moisture and improve soil biomass.
- Install root barriers to prevent pine root intrusion.
- Establish a regular watering regime for the first three years.
- Implement weed control and regular health inspections for both species.
- Prune pines and young tulip trees as needed to optimize light and structure.
- Monitor pines annually for dieback, new growth and pruning requirements.
- Annual pruning cycles for both Pinus (Limb reduction, deadwood removal) and Liriodendron (formative pruning).



MCG CONSULT

Chocolate Experience at Cadbury

Traffic Impact Assessment Report

Project Number - 23207

4 March 2026

mcgconsult.com.au

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

Revision

Revision	Date	Comment	Prepared By	Checked By
A	23 September 2025	Final	M Crawford & J Cheng	N McCracken
B	14 November 2025	Final	J Brownlie & M Crawford	J Brownlie
C	23 January 2026	Final	M Crawford	N McCracken
D	16 February 2026	Final	M Crawford	N McCracken
E	4 March 2026	Final	M Crawford	N McCracken
Filename: 23207-TR-RP-001-E TIA report.docx				

Approved by



Neale McCracken
MEng (Civ) MIEAust CPEng NER APEC Engineer IntPE(Aus)
Associate Director
For and on behalf of
MCG Consult Pty Ltd

Acknowledgement of Country

In the spirit of reconciliation, MCG Consult acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and we extend that respect to all Aboriginal and Torres Strait Islander peoples.

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Appendix B Swept Path Checks
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MCG CONSULT

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1 Background

1.1 Project Overview

MCG Consult has been commissioned to prepare a Transport Impact Assessment (TIA) in connection with a proposed Chocolate Experience at Cadbury development at 100 Cadbury Road, Claremont.

The proposal consists of a new building to house the Chocolate Experience, together with modifications to the surrounding landscape treatments and car parking to accommodate the expected number of visitors, as described below.

The proposal does not include the existing Cadbury factory, which is not part of this application.

Walking & Cycling

Pedestrian access will be via path connections between the subject site and adjacent car park.

It is proposed to remove the existing wombat crossing and construct 2 new wombat crossings either side of the existing crossing along the pedestrian desire lines. The western crossing will primarily service the visitor car park while the eastern crossing will service the staff parking area.

Cyclists will be able to access the subject site at Cadbury Service Road and the adjacent bike trail.

Vehicle Access & Parking

Primary vehicle access to the site is via a car park located north of the site on Cadbury Road. The car park currently provides 482 car spaces.

The car park will be modified to provide a total of 432 parking spaces with 303 spaces allocated for existing factory workers, within a fenced off secure area towards the front of the site, accessed from the existing crossover. The remaining 129 spaces will be allocated to visitors and staff of the proposed development, within the rear of the parking area. Access to visitor parking will be provided by a modified accessway, towards the west of the site.

An additional 9 spaces for parents with prams, 3 drop-off/pick-up spaces and 3 DDA spaces will be provided along the internal access road that serves the proposed building. In total, 144 spaces will be available to visitors and staff of the proposed development.

Loading Vehicles

Loading vehicles will use the Cadbury Service Road to access a dedicated loading area for the proposed development. The loading area can accommodate trucks up to 12.5m long.

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1.2 Purpose and Contents

This report sets out an assessment of the transport impacts of the proposed development, including:

- External pedestrian, bicycle and public transport access
- Bicycle parking
- Car parking provision
- Vehicle access
- Travel demands and traffic impacts
- Loading vehicle access.

1.3 References

- A desktop inspection of the site and its surrounds
- Tasmanian Planning Scheme - Glenorchy
- AS 2890 *Parking Facilities* (set)
- Plans for the proposed development, prepared by Cumulus Studio and Realm Studio
- "*Cadbury Chocolate Experience Visitor Arrivals Assessment*" prepared by BDA, dated January 2026
- Traffic and parking data, where noted
- Crash data as provided by Glenorchy Council
- Traffic volume data as provided by Council
- Other documents and information as nominated.

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2 Development Context

2.1 Subject Site

The subject site is located at 100 Cadbury Road in Claremont, 16km from Hobart. It is rectangular in shape, covering 0.58 hectares. The site fronts Windermere Bay to the south and Cadbury Road to the north.

The site is in light and General Industrial Zones– see Figure 2.2. Surrounding land uses and key trip attractors include:

- Industrial land uses on adjacent properties
- A mix of Recreation and General Residential zones in the wider area

Pedestrian and general vehicle access to the existing site is provided from Cadbury Road.

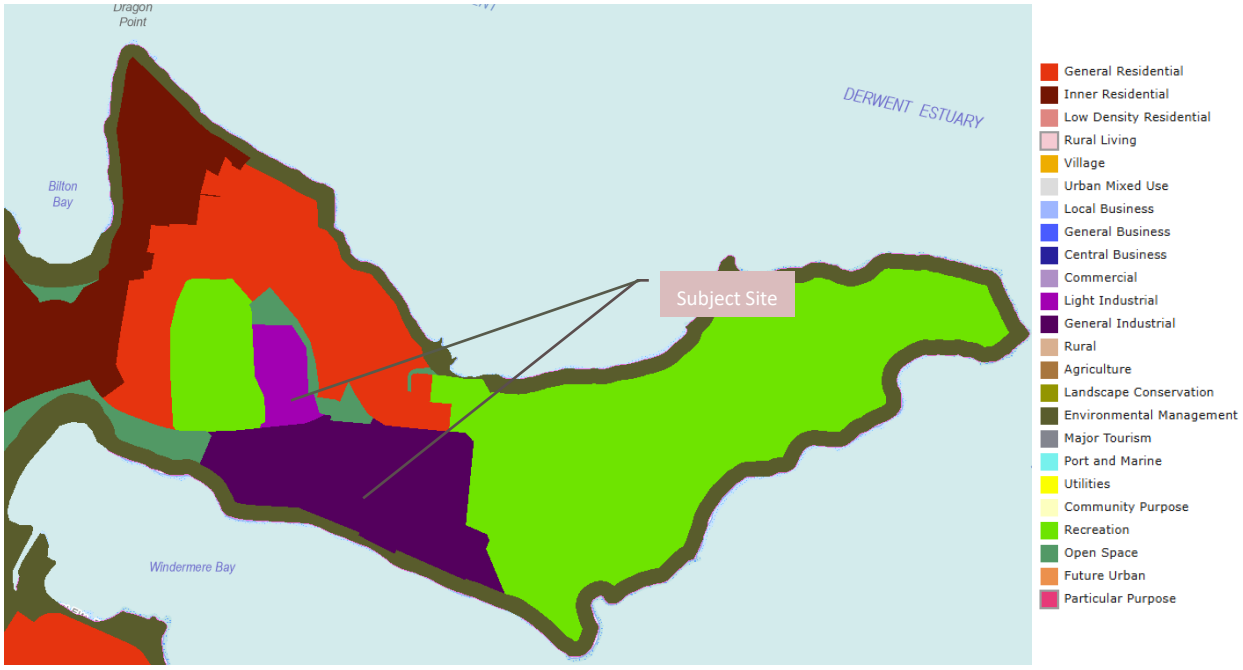
Figure 2.1 – Locality Plan



Source: MetroMap, edited by MCG Consult

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Figure 2.2 – Subject site location and land zoning



Source: LISTmap, edited by MCG Consult

2.2 Proposed Development

Architectural drawings for the proposed development have been prepared by Cumulus Studio. An extract of the site plan is shown in Figure 2.3.

The development comprises:

- 5,875 sqm ticketed Chocolate Experience at Cadbury (CEC) building, incorporating:
  - 683 sqm café (185 sqm indoor + 181 sqm outdoor + 139 sqm servery + 178 sqm kitchen)
  - 278 sqm emporium
- 144 car parking spaces, including:
  - 9 parent and pram car parking spaces on the building frontage road
  - 3 standing/drop-off/pick-up spaces on the building frontage road
  - 3 DDA compliant parking spaces building frontage road
  - 129 car parking in a separate visitor car park
- 6 motorbike spaces in a separate visitor car park
- Pedestrian access between the car park and the proposed building via a pedestrian crossing at Cadbury Road
- 20 bike spaces at the proposed building
- Removal of the existing crossing facility and road hump and the provision of 2 new wombat crossings on Cadbury Road
- A jetty for proposed ferry services to Hobart.

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MCG Consult has been advised that primary access to the site is expected to be by ferry services, based on market research[1].

Parking for 144 cars will be provided in a dedicated area for use by visitors and employees of the subject site (including 15 spaces provided along the internal access road). Parking spaces will be monitored to ensure that car parking demand does not exceed available spaces by requiring guests to book a space when purchasing their ticket. The majority of parking (129 spaces) will be provided in an area separate to the parking for Cadbury factory workers. Due to operational reasons associated with the Cadbury factory staff parking, the Experience Centre parking will be provided towards the rear of the car park.

A pedestrian path and new wombat crossings will connect the subject site car park and the proposed building.

The development is designed to accommodate three distinct use cases across different times of day:

- **Daily Operations** - The site will function as a public-facing visitor attraction during daytime hours, offering immersive chocolate-themed experiences, food and beverage services, and family-friendly amenities.
- **Evening Functions** - The central atrium space, known as “Chocolate Central,” will be available for private bookings during evening hours. These may include welcome events, gala dinners, awards nights, and weddings. Such functions are expected to occur occasionally and will not form part of the regular daily operations.
- **Annual Public Events** - The proposal includes provision for up to four public events per year to be held in the surrounding parklands. These events will be managed separately from the day-to-day visitor experience.

[1] “Cadbury Tourism Experience Demand Potential Assessment" prepared by Evolve Tourism, dated February 2026

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Figure 2.3 – Proposed site plan



Source: Realm Studios

2.3 Surrounding transport conditions

Vehicle Access and Road Network

Existing Vehicle Access

The site has 5 access points, see Figure 2.4. The northern accesses points are commonly used by light vehicles, with the other points being used by heavy and light vehicles without any movement restrictions.

Figure 2.4 – Existing Vehicle Access Locations (Orange arrow indicates heavy vehicle access)



Source: Metro map, edited by MCG Consult

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Existing road network

Table 1.1 – Existing Road network characteristics

Road Name	Road Authority	Reserve Width	Lanes	Footways	Bike Network	Speed Limit
Cadbury Road	Glenorchy City Council	15-23m	2 lanes	1.5-2.5m either side	N/A	50km/h
Bilton Street	Glenorchy City Council	15.5m	2 lanes	1.0-1.3m either side	N/A	50km/h
Main Road	Glenorchy City Council	20m	2 lanes, with parking either side	1.5-3m either side	N/A	50km/h
Box Hill Road	Glenorchy City Council	12.5m	2 lanes	2.0m northern side	N/A	50km/h

Future road network improvements

Several road network improvements proposed in the Greater Glenorchy Plan and Hobart Transport Strategy 2024 are expected to impact the area surrounding the subject site. Notably, upgrades to the Brooker Highway and key intersections nearby aim to improve traffic flow and safety. The development of the Main Road shared pathway between Granton and Glenorchy will enhance active transport access along this important corridor. These upgrades will support increased movement in and around the Claremont area.

Existing Traffic Volumes

Figure 2.5 – Vehicle Count Location



Source: Google maps, edited by MCG Consult

Table 2.2 – Peak hour existing traffic counts

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
AM Peak	236	253	265	235	216	248	230
PM Peak	254	278	307	162.5	284	230	238

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Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
24hr volume	3166	3062	3464.5	2195	2935	2856	2633

Source: MetroCount Traffic Executive

Existing traffic counts were surveyed from the 1st of November 2022 to the 11th of November 2022, at 25 Cadbury Road Claremont, seen in Figure 2.5. The survey site is located approximately 1km to the west of the subject site. Table 2.2 highlights the peak hour traffic volumes collected throughout the week. These peak periods are relatively low for traffic engineering terms.

Crash Statistics

MCG Consult has undertaken a review of publicly available road crash datasets, as published on the ArcGIS website, for the roads and intersections 500m from the subject site

This dataset provides a simple overview of individual crashes in Tasmania over the last 5 years, noting that this dataset contains records of all crashes causing injury that have occurred in Tasmania since 2009 and categorises these as follows:

- Fatal injury
- Serious injury
- Minor injury:
- First Aid injury
- Property damage only
- Not Known

Reference to this dataset shows the following:

- October 2020 – Property damage only (Bournville Crescent, south side of Cadbury Road)
- October 2022 – Minor Accident (Off road at Cadbury Road, north of Pascall Avenue)
- March 2025 – Property damage only (Intersection of Cadbury Road and Somerdale Road)
- October 2025 – Minor Accident (Intersection of Keynsham Road and Mitcham Road)

Reference to the above statistics would suggest that in the most recent 5-year period, there has been a total of 4 reported crashes, 2 of which resulted have been recorded as a Minor Accident. Out of the 4 crashes reported, 2 involved only property damage. There is no pattern to the type of crashes, and the number of is low relative to the amount of traffic using roads in the study area. The proposed development is not expected to materially contribute to a change in the number or severity of crashes.

Existing active travel network

Walking Network

Relevant key walking links and crossing points are shown on Figure 2.7. This shows existing connections between the surrounding residential area, the nearby Cadbury Road bus stop and the wider footway network via the Foreshore Reserve.

Existing walking usage (in relative terms) is shown in Figure 2.7. In terms of trip-making activity to the proposed development, while walking trips are possible, they are not expected to significantly contribute to the travel mode share of the Experience Centre.

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Figure 2.6 – Key existing footways and crossing points

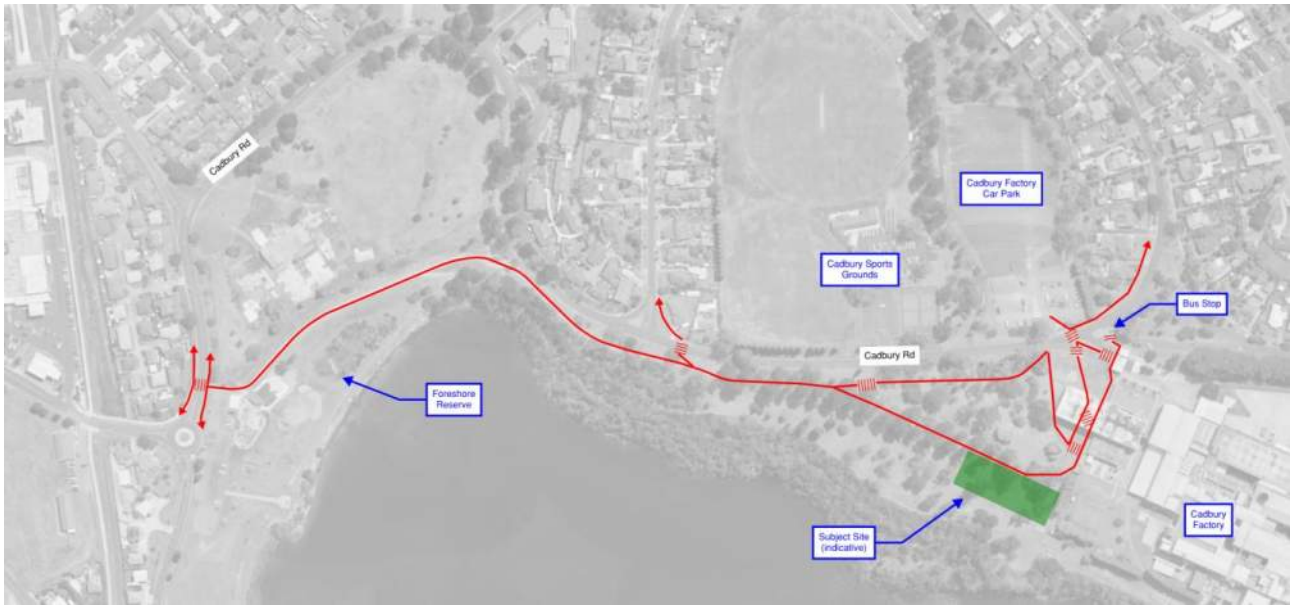


Image: MetroMap, edited by MCG Consult.

Figure 2.7 – Existing walking usage



Source: Strava, edited by MCG Consult

Bike Network

There are no formal on-road cycling routes in the immediate vicinity of the subject site. Cadbury Road is not part of any designated cycling network; however, people were still observed riding bikes in the area, as shown in Figure 2.8.

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Intercity Cycleway

Located to the west of the site, the Intercity Link is a combined bicycle and pedestrian pathway providing direct access from Hobart, as illustrated in Figure 2.9. In addition, the Glenorchy Cycling Infrastructure Plan highlights the Intercity Cycleway as a major recreational route with a route running along Cadbury Road identified as a Neighbourhood route. These arrangements facilitate safe, legible travel from Hobart including for individuals using e-scooters and bikes.

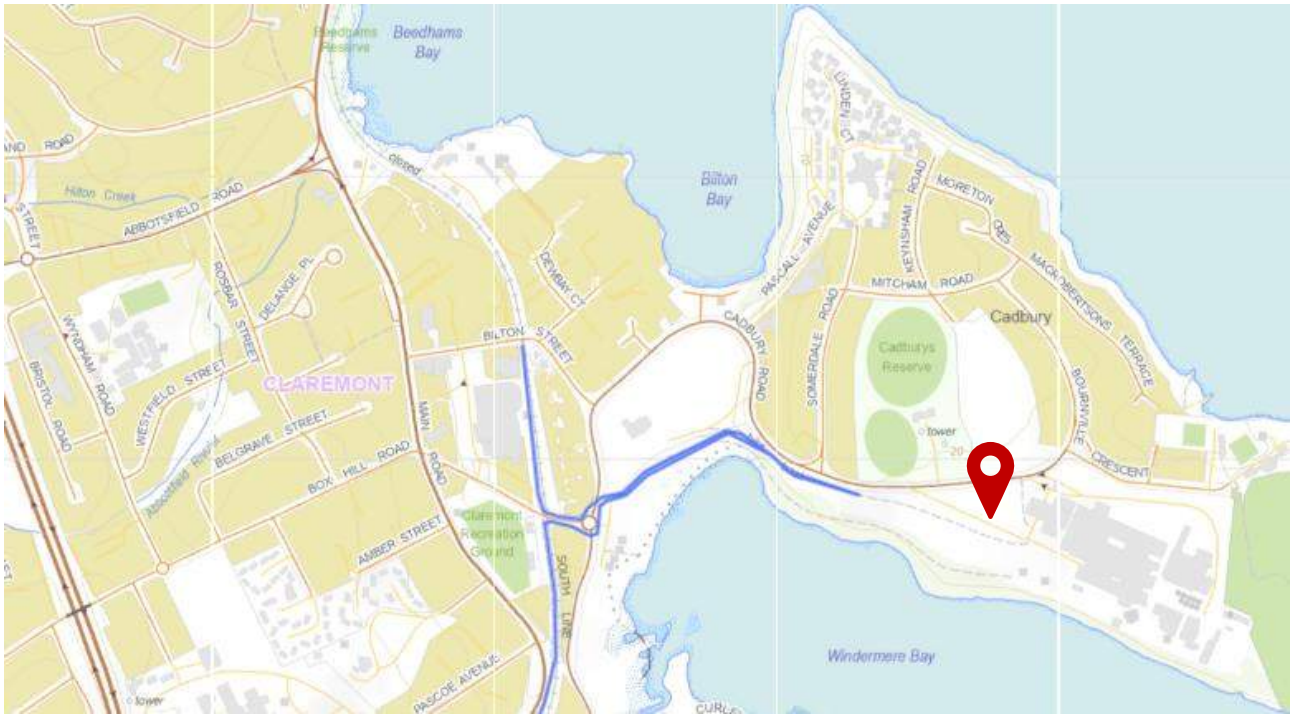
Figure 2.8 – Existing bike usage



Source: Strava, edited by MCG Consult

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Figure 2.9 – Intercity Cycleway (Blue)



Source: Greater Hobart Trails, edited by MCG Consult

Future active travel improvements

The Greater Glenorchy Plan outlines several infrastructure improvements that are either underway or likely to occur, with potential to significantly improve transport and active travel outcomes. These include upgrades to cycling infrastructure, such as a proposed shared pathway along Main Road to enhance pedestrian and cyclist safety.

Council has advised that the works currently underway will likely not affect this development.

Public Transport

Existing public transport network

The 512-bus service (Glenorchy Bus Interchange –Cadbury Factory) operates at a frequency of one service every hour throughout the day between 8am to 6pm. A bus stop is provided close to the entry of the Cadbury factory, as shown in Figure 2.6. Existing points and footway connections link this bus stop to the Experience Centre site.

Future public transport improvements

Once the Chocolate Experience at Cadbury site opens, the uplift in movement, driven by new jobs and visitors, may prompt improvements to public transport services, including increased bus frequency or extended routes. Enhancing public transport would support sustainable travel choices and help manage the anticipated rise in demand.

2.4 What this means for the proposed development

The review of current conditions shows that the site is primarily accessible by car. Although a bus service, walking, cycling, other riding options are available, they will not significantly contribute to the trip-making

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activity of the proposal, which is predominately expected to be ferry usage, followed by car use and coaches trips.

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3 Parking

3.1 Bike Parking & End of Journey Facilities

Cycling is an efficient form of travel that can replace car journeys of up to 5km (a 30-minute bike ride). It is effective for short, local trips, particularly those that are just outside convenient walking distance.

The statutory bike parking requirements for each use case are outlined in Table 3.1 and Table 3.2.

Table 3.1 – Daily Operation Statutory bike parking requirement based on C2.0 of the Tasmanian Planning Scheme

Land Use	Yield	Bike Parking Rate	Parking Requirement
Food services – Café	683 sqm	1 space per 75 sqm of floor area	10 spaces
General retail and hire	278 sqm	1 space per 100 sqm of floor area	3 spaces
Tourist operation	5,875 sqm	1 space per 1,000 sqm of floor area	6 spaces
		Total	**19 spaces**

Assessment is based on the rates specified in Clause 2.0 of the Tasmanian Planning Scheme

Table 3.2 – Evening Events Statutory bike parking requirement based on C2.0 of the Tasmanian Planning Scheme

Land Use	Yield	Bike Parking Rate	Parking Requirement
Community meeting and entertainment	738 sqm 600 seats	4 spaces plus 2 spaces for each 1,500 sqm	6 spaces
		Total	**6 spaces**

Assessment is based on the rates specified in Clause 2.0 of the Tasmanian Planning Scheme

Table 3.3 – Public Event Statutory bike parking requirement based on C2.0 of the Tasmanian Planning Scheme

Land Use	Yield	Bike Parking Rate	Parking Requirement
Community meeting and entertainment	n/a	No requirement – events come under exemption at 4.1.2	0 spaces
		Total	**0 spaces**

Assessment is based on the rates specified in Clause 2.0 of the Tasmanian Planning Scheme

The highest statutory bike parking requirement occurs during daily operation, requiring 19 spaces. The site proposes to provide 20 bike parking spaces, exceeding the requirement and is therefore adequate. End of journey facilities are not required under C2.0 of the Tasmanian planning scheme.

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3.2 Car Parking

Existing and Proposed Car Parking Provision

508 car spaces currently serve the existing Cadbury facility. Most of this parking (482 spaces) is provided in an off-street car park located north of Cadbury Road. The remainder (26 spaces) are provided on-street to the north of the factory building.

Statutory Car Parking Requirements

The statutory car parking requirements for each use case are outlined in Table 3.4 to Table 3.6.

Table 3.4 – Daily Operation Statutory car parking requirement based on Clause 2.0 of the Tasmanian Planning Scheme

Land Use	Yield	Car Parking Rate	Parking Requirement
Food service Café	683 sqm	Greater of 1 space per 15 sqm of floor area or 1 per 3 seats	103 spaces
General Retail and Hire	278 sqm	1 space per 30 sqm of floor area	10 spaces
Tourist operation	5,875 sqm	1 space per 200 sqm of floor area	30 spaces
		Total	**143 spaces**

Assessment is based on the rates specified in Clause 2.0 of the Tasmanian Planning Scheme

Table 3.5 – Evening Functions Statutory car parking requirement based on Clause 2.0 of the Tasmanian Planning Scheme

Land Use	Yield	Car Parking Rate	Parking Requirement
Community Meeting and Entertainment	738 sqm	Greater 1 space per 15 sqm of floor area or 1 space per 3 seats	50 spaces by floor area or 200 spaces by seats
		Total	**200 spaces**

Assessment is based on the rates specified in Clause 2.0 of the Tasmanian Planning Scheme

Table 3.6 – Public Event Statutory car parking requirement based on Clause 2.0 of the Tasmanian Planning Scheme

Land Use	Yield	Car Parking Rate	Parking Requirement
Community Meeting and Entertainment	-	No requirement – events come under exemption at 4.1.2	0 spaces

Assessment is based on the rates specified in Clause 2.0 of the Tasmanian Planning Scheme

The highest statutory car parking requirement occurs during evening functions, requiring 200 spaces. The site proposes to provide 144 car parking spaces, a shortfall of 54 spaces from the requirements.

In this instance the statutory parking requirements does not accurately reflect the specific nature of the proposed development or its travel patterns. MCG Consult has been advised that most trips will be made by ferry, a parking demand assessment was undertaken to quantify the development's actual car parking needs, this is set out below, noting this analysis applies to the busiest days of the year.

Anticipated Car Parking Demand

It is proposed the Experience Centre uses parking that is current part of a larger car park used by Cadbury factory employees. It is necessary to determine the parking requirement of those existing employees, and

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any other requirements of the operator, Mondelez, together with any car parking design considerations result in a remaining amount of car parking that is appropriate for Experience Centre parking demands.

Existing Manufacturing Use

Based on information provided by the Applicant, a first-principles assessment was undertaken to test whether the provisions of 303 car spaces for the existing workers is a reasonable to accommodate the parking demand for the existing use.

The facility operates 24 hours a day across three shifts of approximately 150 staff each. Allowing for up to 50 percent shift overlap and assuming every staff member travels by their own private car (no car pooling) - a conservative assumption - the estimated parking demand is 225 spaces (150 spaces + 75 spaces = 225 spaces).

This estimate aligns with aerial photography, which shows up to 220 vehicles occupying the on-site car park and adjacent street parking.

While 225 spaces is the calculated parking demand of the existing factory, the operator, Mondelez, has requested that 300 parking spaces are retained for its exclusive use and that these spaces are separately accessed from any Experience Centre parking.

The provision of 303 on-site spaces will accommodate the existing peak parking demands for staff parking associated with the Cadbury Factory. It is reiterated that the existing factory is not part of this proposal.

The car parking design, to include separate vehicle accesses for both the existing and proposed use, leaves 129 car spaces for Experience Centre.

Proposed Development Car Parking Demand

The applicant has undertaken a first-principles assessment of expected visitor arrivals and dwell times, as documented in the Cadbury Chocolate Experience Visitor Arrivals Assessment[2]. This assessment integrates public survey data with anticipated ticketing operations to model possible daily arrival and departure profiles for the site. These are the stated preferences of those surveyed – the resulting visitor profiles, including access to car parking can be fully controlled by the operator through ticketing.

The CEC is projected to attract 431,000 visitors annually and 2,350 visitors on its busiest days of year in February. The following assumptions are made for traffic generation on the busiest day:

- 70% of all visitors will arrive via ferry, 25% via private vehicles, 5% via coaches.
  - Market research indicates an average of 61% of visitors would travel by ferry[2] over the course of a year; however, the reality is that this can be controlled by ticketing to match car parking availability[3].
- An average vehicle occupancy of 3 people per vehicle and 35 people per coach.[4]
- An average dwell of 1.5 to 3 hours (3 hours has been adopted as a worst case).

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2 Cadbury Tourism Experience Demand Potential Assessment" prepared by Evolve Tourism, dated February 2026.

3 A range of ticketing options can be made available, including:
- tying tickets to ferry use
- car parking bookings.

Ticket-only options can be limited or removed on the busiest days. Incidental arrivals will quickly be able to be quantified and become predictable, allowing for further refinement of ticketing sales if needed.
The amount of ticket types can be varied across different dates to ensure car parking demand is balanced with supply.
This information can be disseminated in advertising material.
Signage at the car park entrances can be provided to advise ad-hoc visitors that it is all-ticket entry, or the car park is full.

4 Conservative estimate based on the traffic generation rates reported in *Mount Wellington Cable Car Traffic Impact Assessment* by Midson Traffic Pty Ltd which assumed and average of 3.3 people per vehicle and 39.5 people per coach.

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The anticipated car parking accumulation for the busiest day of the year is summarised in Table 3.7.

Table 3.7 – Anticipated Car Parking Accumulation (visitors to the proposed development)

	Total Arr (ppl)	Total Dep (ppl)	Total Arr (Veh)	Total Dep (Veh)	Cars Parked
8:45 AM	159	0	13	0	13
9:15 AM	177	0	15	0	28
9:45 AM	177	0	15	0	43
10:15 AM	177	0	15	0	58
10:45 AM	157	17	13	1	69
11:15 AM	137	35	11	3	78
11:45 AM	177	35	15	3	**90**
12:15 PM	177	177	15	15	**90**
12:45 PM	177	177	15	15	**90**
1:15 PM	177	177	15	15	**90**
1:45 PM	157	177	13	15	88
2:15 PM	137	157	11	13	86
2:45 PM	167	137	14	11	89
3:15 PM	162	177	14	15	87
3:45 PM	35	177	3	15	76
4:15 PM	0	177	0	15	61
4:45 PM	0	177	0	15	46
5:15 PM	0	157	0	13	33
5:45 PM	0	137	0	11	22
6:15 PM	0	132	0	11	11
6:45 PM	0	127	0	11	0
Total	2350	2350	196	196	-

Vehicle trips based on 15% car (driver and passenger) travel mode share and 3 people per car (which is typical for a tourism use).

Our analysis indicates a maximum parking demand of up to 90 car spaces occurring from 11.45am to 1.15pm.

The Applicant has also indicated that there will be up to 49 employees on site. A further, 45 car spaces on the assumption that 90% drive their own car and park.

The overall car parking demand of the proposed development on the peak day of the year is estimated to be 135 car spaces. The parking demand for a typical day can reasonably be expected to be lower than this.

The above assessment captures 96% of tourists arriving by a ticked experience. The remaining 4% will be incidental. Incidental arrivals will quickly be able to be quantified and become predictable, allowing for further refinement of ticketing sales if needed.

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Adequacy of Parking Provision

The Applicant proposes to divide the existing car park and maintain 303 car spaces for existing factory employees. An additional 144 car parking spaces will be provided for the Experience Centre including 129 in the car park with an additional 9 parent with pram spaces, 3 standing/drop-off/pick-up spaces and 3 DDA spaces along the internal access road that fronts the proposed building.

The provision of 144 car parking spaces is more than adequate to accommodate the peak parking demand of 135 spaces (visitors and staff).

The proposed car parking provision is acceptable.

Parking Demand for Evening Functions and Annual Events

The Applicant advises that the operators of the visitor experience centre will oversee ticket sales for annual events and evening functions. All attendees must purchase a ferry ticket as part of the event package. Therefore, access to the site for these occasions will exclusively be via ferry.

Regarding staff, it is estimated that up to 49 individuals could be present to support both annual events and evening functions. Only 45 parking spaces or fewer would be needed in the car park, on the assumption that 90% drive their own car and park, as some employees may opt to car pool or travel by other modes from the local area. Therefore, sufficient parking will be available as events run outside of the Experience Centre's day-to-day operating hours.

Car Parking for People with Disabilities

The National Construction Code (NCC) specifies minimum rates of car parking that must be provided for people with disabilities. The requirement is based on building classification. Those relevant to the proposed development are set out in Table 3.8.

Table 3.8 – Parking for People with Disabilities

Land Use	NCC Building Class	Requirement	Required Provision
Tourism	Class 5	1 space for every 100 spaces or part thereof	2 spaces (for 144 spaces provided)
Retail/Café	Class 6	1 space for every 50 spaces or part thereof	1 space (on the basis that this is a minor use, but will still have a non-zero parking demand)

The proposed development is subject to a statutory requirement to provide 3 accessible parking spaces for people with disabilities. The proposal includes 3 accessible spaces located near the building's entrance. This provision meets the minimum requirement and is therefore acceptable.

3.3 Motorbike Parking

Statutory Requirement

Motorbikes offer an agile and convenient mode of transport, well-suited for replacing car trips of moderate distance—typically up to 10km, or around a 20-minute ride. They are particularly effective for commuting through urban areas with heavy traffic, as well as for journeys just beyond comfortable cycling range.

The statutory requirement for motorcycle parking for the proposed development is set out in Table 3.9

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Table 3.9 – Statutory motorbike parking requirement based on C2.0 of the Tasmanian Planning Scheme

Car Parking	Motorbike Parking Rate	Parking Requirement
200 car spaces	1 space + 1 space for every additional 20 car parking spaces required over 40 spaces	9 motorbike spaces

Assessment is based on the rates specified in Clause 2.0 of the Tasmanian Planning Scheme

Anticipated Motorbike Parking Demand

Applying the standard ratio to 200 car spaces (calculated using Clause 2.0 of the Planning Scheme) would generate 9 motorcycle spaces. This is excessive and not aligned with the actual travel demand of the site. Our assessment identifies a requirement for 135 car spaces based on the travel characteristics of the site. However, 144 car spaces are proposed. We have therefore used 144 car spaces as the metric to determine motorcycle parking.

The proposed development is subject to a statutory requirement to provide 6 motorbike spaces. The proposal includes 6 spaces to be delivered in the car park as 5.5m long by 1.2m spaces in accordance with AS 2890.1. This provision matches the demand, which we consider acceptable.

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4 Traffic Impact

4.1 Traffic Generation

4.2 Overview

The process of identifying, assessing and quantifying the potential traffic-related implications of the proposed development is described in this section of the TIA.

The assessment methodology is as follows:

- Ascertain the required performance objectives
- Establish the appropriate future design year
- Determine the base volumes (existing background traffic growth)
- Estimate the quantum of traffic generated by the development proposal
- Assign the traffic to the future transport network
- Assess the performance of key intersections connecting to the site under interim and ultimate conditions.

4.3 Performance Objectives

Assessment Context

The purpose of this assessment is to ultimately understand the requirements of the proposed site at full-build out. Consistent with Tasmania's TIA guidance, a 10-year horizon scenario to assess the development impact has been completed. In this instance, the opening year is taken to be 2027 and the 10-year horizon scenario has been set at 2037. This is 12 years from the of the traffic survey in 2025.

Likely Traffic Growth

The location of the subject in a mature residential area, with no other significant developments planned, indicates that only the proposed development will contribute to any measurable traffic growth on roads in the surrounding area. This is reasonable when set against a backdrop of a steady population in Glenorchy (marginal decline)[5] and a slowing overall population growth rate for Tasmania[6].

4.4 Existing Conditions

MCG Consult commissioned traffic movement counts at the intersections of Main Road/Bilton Street, Main Road/ Box Hill Road, Box Hill Road/ Cadbury Road, Cadbury Road/Bilton Street and the Cadbury car park access on Friday 4 July & Saturday 5 July 2025 during the following peak periods:

5 https://profile.id.com.au/glenorchy/population-estimate accessed by MCG Consult in July 2025

6 https://blog.id.com.au/2023/population-forecasting/the-ripple-effect-how-tasmanias-population-growth-will-shape-demand-for-essential-services accessed by MCG Consult in July 2025

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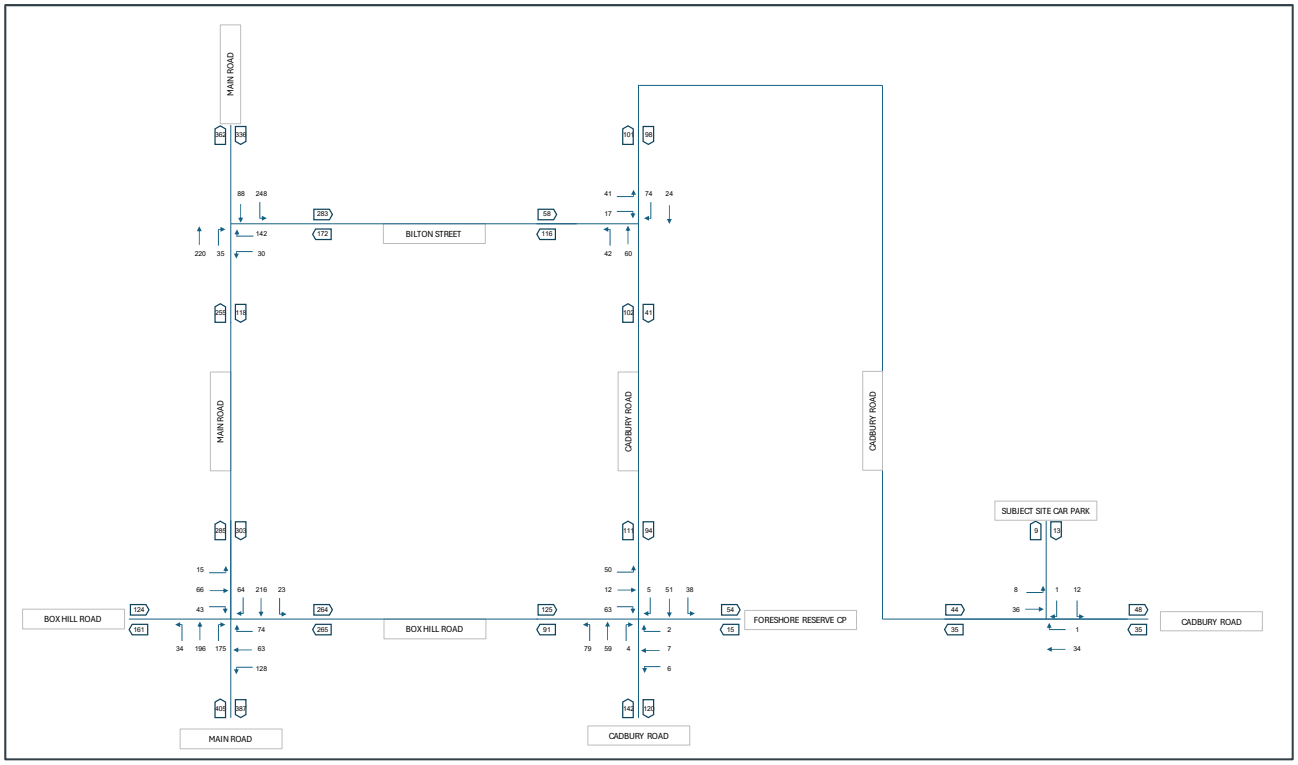
- Friday Midday Peak: 11:30am to 1.30pm
- Saturday Midday Peak: 11:30am to 1.30pm

The survey identified the following road network peak hours for assessment:

- Friday Midday Peak: 12:30pm to 1.30pm
- Saturday Midday Peak: 11:45am to 12.45pm

The Friday and Saturday peak hour traffic volumes are shown in Figure 4.1 and Figure 4.2, respectively.

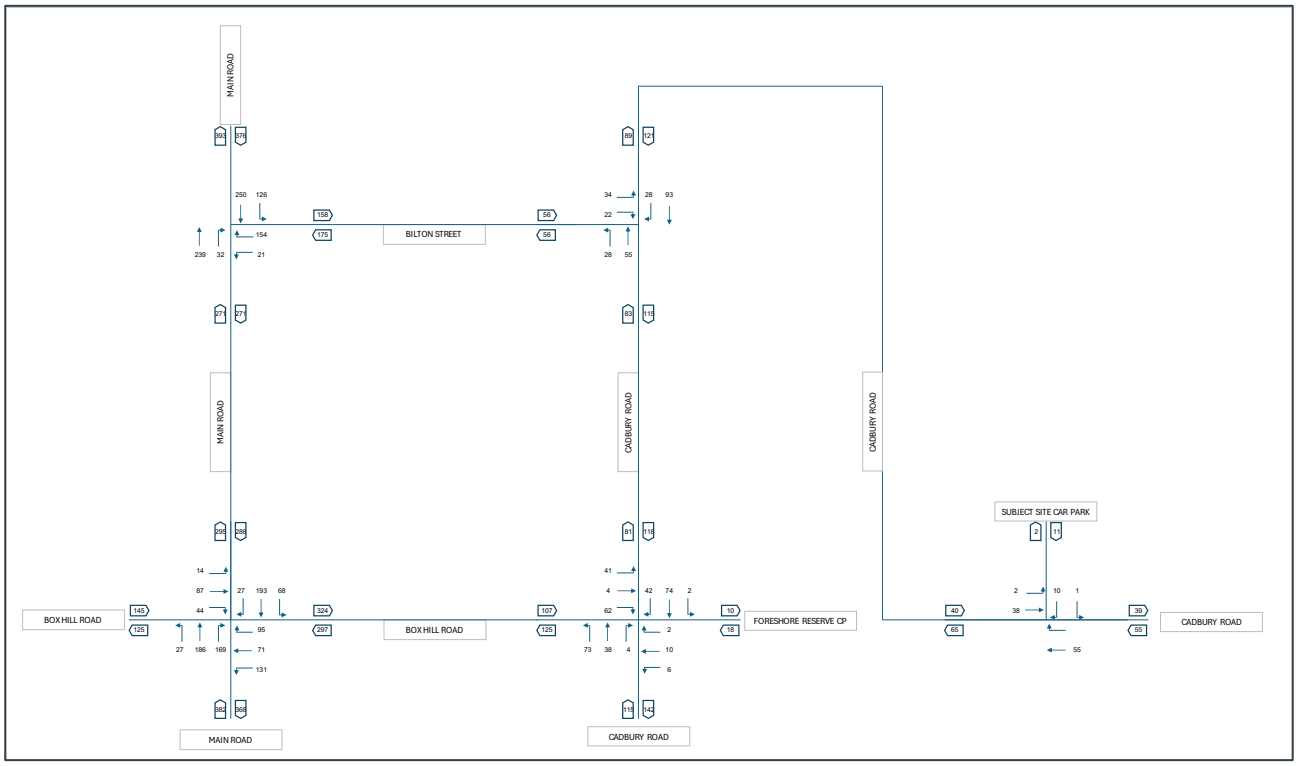
Figure 4.1 – Existing Friday Peak Hour Traffic Volumes



Source: MCG Consult

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Figure 4.2 – Existing Saturday Peak Hour Traffic Volumes



Source: MCG Consult

4.5 Current Intersection Performance

The existing operation of intersections in the study area has been assessed using *SIDRA INTERSECTION*[7], a computer-based modelling package which calculates intersection performance.

The commonly used measure of intersection performance is referred to as the *Degree of Saturation (DOS)*. The DOS represents the flow-to-capacity ratio for the most critical movement on each leg of the intersection. For signalised intersections and roundabouts, a DOS of around 0.95 has been typically considered the practical limit, beyond which queues and delays increase disproportionately[8]. For unsignalised intersections this limit is a DOS of around 0.90.

The current year SIDRA traffic analysis adopts the following modelling assumptions:

- The Main Road/Box Hill Road signalised intersection has been modelled using a cycle time of 60 seconds for the Friday and Saturday peak hour.
- Pedestrian phases have conservatively been assumed to operate every cycle.

7 Program used under license from Akçelik & Associates Pty Ltd.

8 SIDRA INTERSECTION adopts the following criteria for Level of Service assessment:

LOS		Intersection Degree of Saturation (X)		
		Signals	Roundabouts	Unsignalised
A	Excellent	<=0.60	<=0.60	<=0.60
B	Very Good	0.60-0.70	0.60-0.70	0.60-0.70
C	Good	0.70-0.90	0.70-0.85	0.70-0.80
D	Acceptable	0.90-0.95	0.85-0.95	0.80-0.90
E	Poor	0.95-1.00	0.95-1.00	0.90-1.00
F	Very Poor	>=1.0	>=1.0	>=1.0

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Table 4.1 and Table 4.2 presents a summary of the existing operation of the intersection. Full results and electronic versions of the model are available by request to MCG Consult.

Table 4.1 – Friday Peak Hour Existing Intersection Performance

Location	Arm	DOS	LOS	95th %ile Q
1. Box Hill Rd & Main Rd	Main Road (S)	0.41	B	34m
	Box Hill Road (E)	0.41	B	17m
	Main Road (N)	0.30	B	36m
	Box Hill Road (W)	0.27	C	16m
	Intersection	**0.41**	**B**	**36m**
2. Box Hill Road & Cadbury Road	Cadbury Road (S)	0.11	A	3m
	Car Park	0.01	A	1m
	Cadbury Road (N)	0.08	A	2m
	Box Hill Road	0.11	A	4m
	Intersection	**0.11**	**A**	**4m**
3. Cadbury Rd & Cadbury Carpark	Cadbury Road (E)	0.02	-	0m
	Cadbury Car Park	0.01	A	0m
	Cadbury Road (W)	0.03	-	0m
	Intersection	**0.03**	**-**	**0m**
4. Bilton St & Main Rd	Main Road (S)	0.12	-	1m
	Bilton Street	0.25	A	8m
	Main Road (N)	0.18	-	0m
	Intersection	**0.25**	**-**	**8m**
5. Bilton St & Cadbury Rd	Cadbury Road (S)	0.05	-	0m
	Cadbury Road (N)	0.06	-	2m
	Bilton Street	0.05	A	1m
	Intersection	**0.06**	**-**	**2m**

DOS – Degree of saturation, LOS – Level of Service

Table 4.2– Saturday Peak Hour Existing Intersection Performance

Location	Arm	DOS	LOS	95th %ile Q
1. Box Hill Rd & Main Rd	Main Road (S)	0.44	B	31m
	Box Hill Road (E)	0.44	B	20m
	Main Road (N)	0.34	B	40m
	Box Hill Road (W)	0.34	C	20m
	Intersection	**0.44**	**B**	**40m**
2. Box Hill Road & Cadbury Road	Cadbury Road (S)	0.1	A	2m
	Car Park	0.02	A	1m

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Location	Arm	DOS	LOS	95th %ile Q
	Cadbury Road (N)	0.1	A	2m
	Box Hill Road	0.09	A	3m
	Intersection	**0.1**	**A**	**3m**
3. Cadbury Rd & Cadbury Carpark	Cadbury Road (E)	0.03	-	0m
	Cadbury Car Park	0.01	A	0m
	Cadbury Road (W)	0.02	-	0m
	Intersection	**0.03**	**-**	**0m**
4. Bilton St & Main Rd	Main Road (S)	0.13	-	1m
	Bilton Street	0.31	B	10m
	Main Road (N)	0.2	-	0m
	Intersection	**0.31**	**-**	**10m**
5. Bilton St & Cadbury Rd	Cadbury Road (S)	0.04	-	0m
	Cadbury Road (N)	0.07	-	1m
	Bilton Street	0.04	A	1m
	Intersection	**0.07**	**-**	**1m**

DOS – Degree of saturation, LOS – Level of Service

4.6 Development Traffic

Traffic Generation

The anticipated car trips profile for the busiest day of the year is summarised in Table 3.7 indicates that the proposed development generates approx. 60 vehicle trips per hour (30 in / 30 out) during the 2-hour period from 12:15pm to 2:15pm of the peak day of the year.

Traffic Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by the:

- configuration of the arterial road network in the immediate vicinity of the site
- existing operation of intersections providing access between the local and arterial road network
- distribution of households in the vicinity of the site
- configuration of site access points.

Having consideration to the above, for the purposes of estimating vehicle movements, the following directional distributions have been assumed:

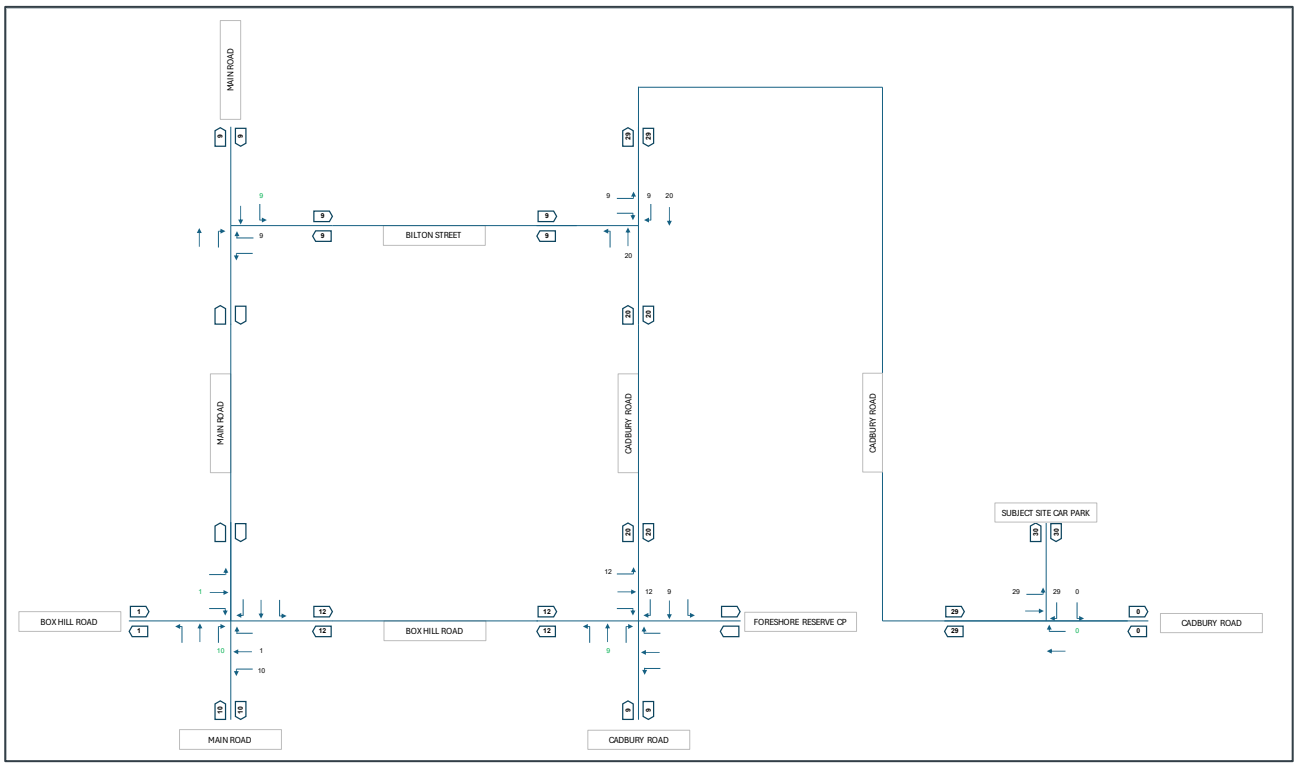
- Main Rd north of the site 30%
- Main Rd south of the site 35%
- Cadbury Road south of the site 30%
- Box Hill Road west of the site 4%

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- Cadbury Road northeast of the site 1%

Figure 4.3 to Figure 4.4 show the proposed development traffic assigned to the road network, based on the above assessment.

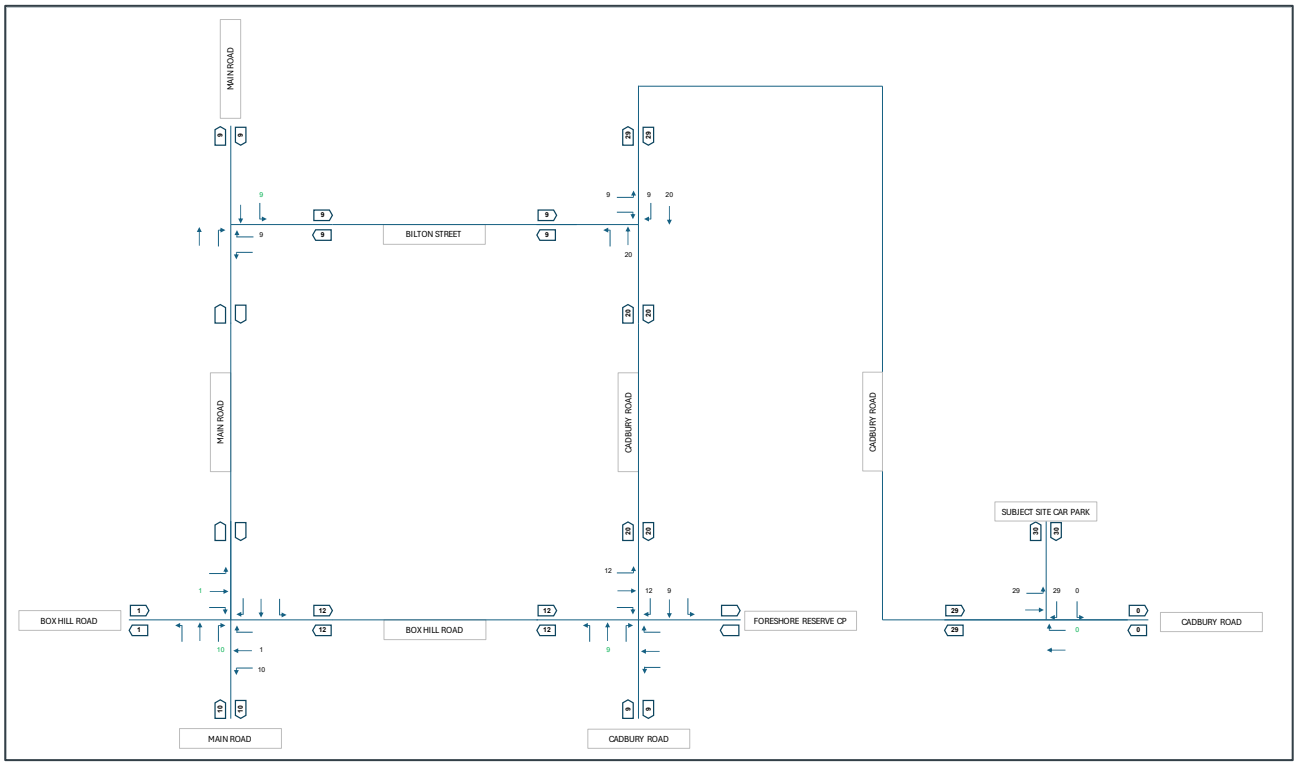
Figure 4.3 – Friday Peak Hour Site Generated Traffic Volumes



Source: MCG Consult

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Figure 4.4 – Saturday Peak Hour Site Generated Traffic Volumes

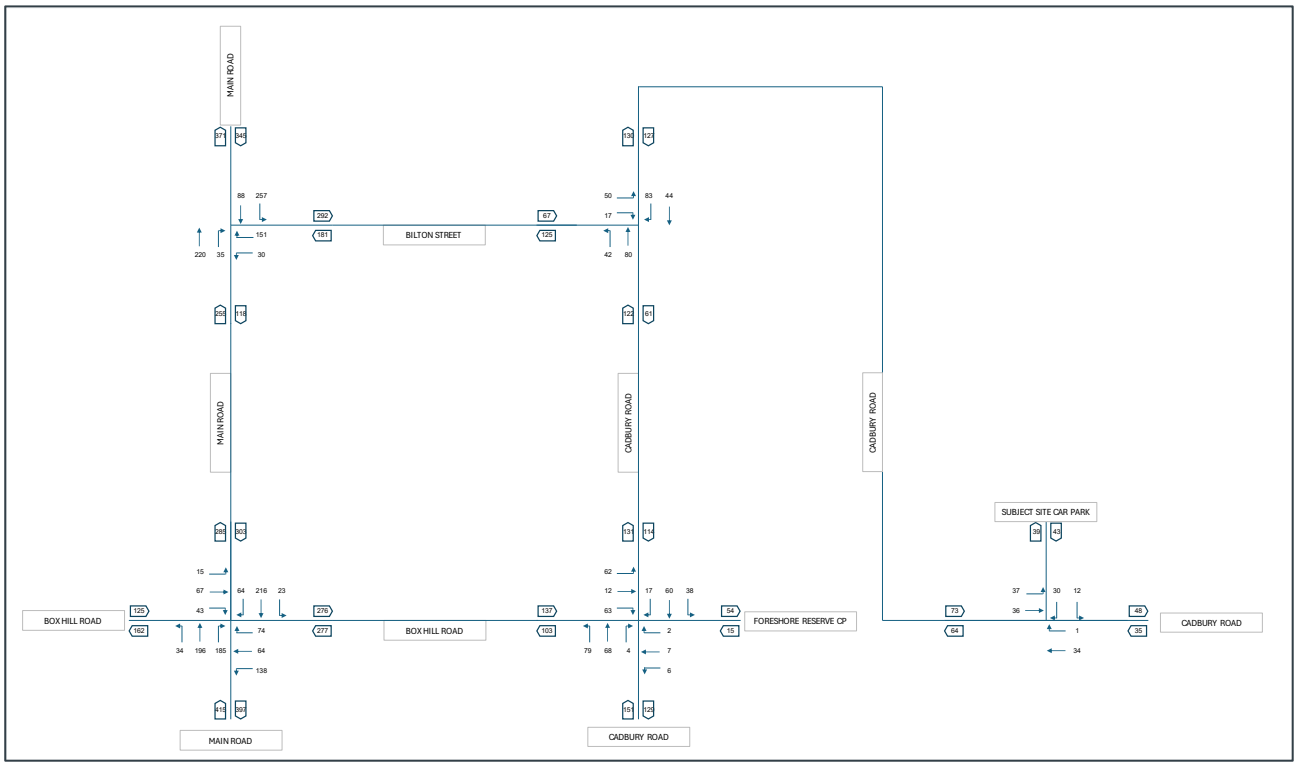


Source: MCG Consult

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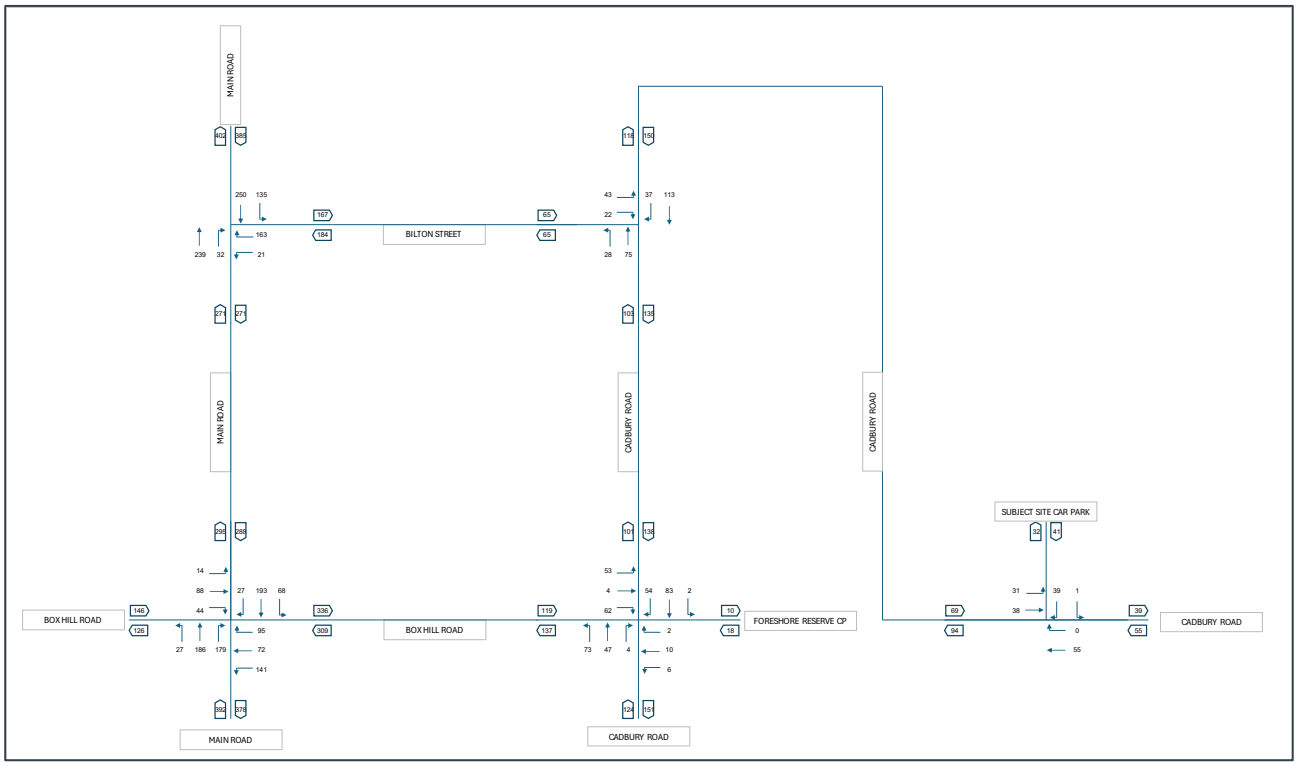
4.7 Post- Development Traffic

Figure 4.5 – Friday Peak Hour Post-Development Traffic



Source: MCG Consult

Figure 4.6 – Saturday Peak Hour Post-Development Traffic



Source: MCG Consult

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4.8 Post-Development Conditions

The post-development intersection operational performance has been assessed using SIDRA Intersection. The results of this assessment are shown in Table 4.3 and Table 4.4 below. Detailed outputs can be provided upon request to MCG Consult.

The results indicate that the intersection will remain within capacity with the proposed development in place, with no notable queuing issues.

Table 4.3 – Friday Peak Hour Post-Development Intersection Performance

Location	Arm	DOS	LOS	95th %ile Q
1. Box Hill Rd & Main Rd	Main Road (S)	0.47	B	36m
	Box Hill Road (E)	0.45	B	17m
	Main Road (N)	0.30	B	35m
	Box Hill Road (W)	0.28	C	17m
	Intersection	**0.47**	**B**	**36m**
2. Box Hill Road & Cadbury Road	Cadbury Road (S)	0.14	A	4m
	Car Park	0.02	A	1m
	Cadbury Road (N)	0.13	A	3m
	Box Hill Road	0.14	A	5m
	Intersection	**0.14**	**A**	**5m**
3. Cadbury Rd & Cadbury Carpark	Cadbury Road (E)	0.02	-	0m
	Cadbury Car Park	0.08	A	2m
	Cadbury Road (W)	0.07	-	0m
	Intersection	**0.08**	**-**	**2m**
4. Bilton St & Main Rd	Main Road (S)	0.12	-	1m
	Bilton Street	0.29	A	9m
	Main Road (N)	0.20	-	0m
	Intersection	**0.29**	**-**	**9m**
5. Bilton St & Cadbury Rd	Cadbury Road (S)	0.08	-	0m
	Cadbury Road (N)	0.11	-	4m
	Bilton Street	0.07	A	2m
	Intersection	**0.11**	**-**	**4m**

DOS – Degree of saturation, LOS – Level of Service

Table 4.4 – Saturday Peak Hour Post-Development Intersection Performance

Location	Arm	DOS	LOS	95th %ile Q
1. Box Hill Rd & Main Rd	Main Road (S)	0.49	B	36m
	Box Hill Road (E)	0.49	B	21m
	Main Road (N)	0.33	B	39m

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Location	Arm	DOS	LOS	95th %ile Q
	Box Hill Road (W)	0.35	C	21m
	Intersection	**0.49**	**B**	**39m**
2. Box Hill Road & Cadbury Road	Cadbury Road (S)	0.12	A	3m
	Car Park	0.02	A	1m
	Cadbury Road (N)	0.14	A	4m
	Box Hill Road	0.12	A	4m
	Intersection	**0.14**	**A**	**4m**
3. Cadbury Rd & Cadbury Carpark	Cadbury Road (E)	0.03	-	0m
	Cadbury Car Park	0.08	A	2m
	Cadbury Road (W)	0.07	-	0m
	Intersection	**0.08**	**-**	**2m**
4. Bilton St & Main Rd	Main Road (S)	0.13	-	1m
	Bilton Street	0.36	B	13m
	Main Road (N)	0.21	-	0m
	Intersection	**0.36**	**-**	**13m**
5. Bilton St & Cadbury Rd	Cadbury Road (S)	0.07	-	0m
	Cadbury Road (N)	0.11	-	3m
	Bilton Street	0.07	A	2m
	Intersection	**0.11**	**-**	**3m**

DOS – Degree of saturation, LOS – Level of Service

Cadbury Road Typical Peak Day

Traffic projections were based on Table 2.7, with two additional vehicle movements for a bus arrival and departure. The road network peak hours on Cadbury Road are 9–10 am and 3–4 pm, however, the development peak hour is around midday, which correspond to when most tourists are expected to arrive and depart. The highest recorded traffic volumes from Tuesday the 1st of November 2022 to Friday the 11th of November 2022 have been used for this assessment to determine ultimate traffic volume. A conservative estimate of 20 vehicles has been included in the trip generation calculations for both the AM and PM peak periods for arriving and departing staff. For peak day traffic assessments, these staff figures are doubled to reflect anticipated daily staff travel volumes.

AM Road Network Peak Period

Table 4.5 – AM Cadbury Road Peak Predicted Traffic

	Current AM Peak Traffic Volume	Proposed Development Trip Generation	Total Peak AM Traffic Volume
Traffic Volume	230	47	**277**

Assessment based on MetroCount Traffic data and Table 3.7 of this report

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PM Road Network Peak Period

Table 4.6 – PM Cadbury Road Peak Predicted Traffic

	Current PM Peak Traffic Volume	Proposed Development Trip Generation	Total Peak PM Traffic Volume
Traffic Volume	257	47	**304**

Assessment based on MetroCount Traffic data and Table 3.7 of this report

Midday Development Traffic Peak Period

Table 4.7 – Midday Cadbury Road Peak Predicted Traffic

	Current Midday Traffic Volume	Proposed Development Trip Generation	Total Peak PM Traffic Volume
Traffic Volume	248	60	**308**

Assessment based on MetroCount Traffic data and Table 3.7 of this report

Peak Day Period

Table 4.8 – Daily Cadbury Road Predicted Traffic

	Current Peak Day Traffic Volume	Proposed Development Trip Generation	Total Peak Day Traffic Volume
Traffic Volume	3,465	404	**3,869**

Assessment based on MetroCount Traffic data and Table 3.7 of this report

Annual Events and Evening Functions

The Applicant advises that the operators of the Experience Centre will manage how tickets are sold for these events and that all visitors will purchase a ferry ticket as part of the event.

Accordingly, all visitors to the site will be via ferry.

With regards to staff, it is considered that up to 49 staff could be on site to service an event, with all staff arriving in the 2 hours prior to an event and departing in the hour following an event.

For assessment purposes it will be adopted that 40% of staff arrive 2 hours prior to an event with 60% in the hour before the event. With the assumption that the event will run from 6pm to 11pm.

Table 4.9 – 40% of staff arriving to the event

	Current 4pm Peak Traffic Volume	Proposed Development Trip Generation	Total Traffic Volume
Traffic Volume	244	20	**264**

Assessment based on MetroCount Traffic data

Table 4.10 – 60% of staff arriving to the event

	Current 5pm Peak Traffic Volume	Proposed Development Trip Generation	Total Traffic Volume
Traffic Volume	264	30	**294**

Assessment based on MetroCount Traffic data

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Table 4.11 – Staff departing from event

	Current 12pm Peak Traffic Volume	Proposed Development Trip Generation	Total Traffic Volume
Traffic Volume	20	50	**70**

Assessment based on MetroCount Traffic data

4.9 Traffic Impact Summary

The proposed development generates up to 60 vehicle trips per hour during the peak hour of the peak day of the year (30 in / 30 out). This is low in traffic engineering terms, representing 1 additional vehicle every 2 minutes in each direction. Traffic modelling has been completed to confirm that intersections in the study area will remain well within capacity.

The proposed development is unlikely to significantly affect the safety or operation of the nearby road network. It is not expected to increase the frequency or severity of traffic incidents. Sightline assessments indicate that adequate visibility will be maintained, so the surrounding network should remain unaffected.

The traffic impact on the existing road network for the proposed development is acceptable, on this basis.

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5 Other Considerations

5.1 Loading Vehicle Access

Loading activities, such as deliveries and waste collection will take place at a dedicated loading area within the subject site. The loading area will be accessed from the existing Cadbury Service Road, which is designed to accommodate heavy vehicle movement.

Figure 5.1 depicts the specified route for heavy vehicles associated with the Experience Centre, including the designated access point for visitors. Access times for these vehicles may be additionally controlled to support visitor safety.

Swept path analysis is provided in Appendix B, which shows that vehicles up to and including a 12.5m single unit truck[9] can enter the loading area, turn around and exit out onto the service road, in a forward direction.

The operation of loading facilities should be managed to ensure there is no adverse impact on the experience provided by the visitor centre.

Figure 5.1 – Heavy Vehicle Route for Experience Centre (Red), Heavy Vehicle Route for Factory (Orange)[10]



Source: MetroMap, edited by MCG Consult

[9] A 12.5m long truck (the Heavy Rigid Vehicle, HRV, in AS 2890.2) is the largest vehicle that will use the Experience Centre loading area.

[10] Heavy vehicle movements for the factory enter and exit via the existing check lodge (see orange arrows).

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5.2 Coach Access

The proposed coach access route to the subject site is shown in Appendix B, showing sufficient road width to accommodate a 14.5m long controlled access bus. The existing buildings on the route have an underside height clearance of 4.2m. Most coaches and other heavy vehicles are well under this height, typically being no more than 4.0m high.

5.3 Sightline Assessment

According to Table 3.2 of Austroads' intersection design guidelines, a sight distance of 97 metres is required for vehicles traveling at 50 km/h, based on a conservative 2-second reaction time. Appendix C shows the available sight distances from both site exits. The sightline must be clear from the approaching vehicle to the conflict point, with an additional unobstructed 7.0-metre setback along the side road.

These requirements are met for the existing access to the car park north of Cadbury Road and for the factory access at Cadbury Road.

These requirements are not met for the existing site access that serves the internal road fronting the building. A tree sits within the sightline clear area. However, this road serves a minor amount of car parking (15 spaces) and is expected to be lightly trafficked. The tree does not fully conceal vehicles waiting on the side road and there is greater visibility from the side road to vehicles travelling along Cadbury Road at distances much further back than 7.0m (perhaps 30m or more). This is an acceptable outcome given it is an existing condition and the expected light use of the access point.

Further, AS 2890.1 indicates that driveways serving car parks can be provided with a minimum stopping site distance of 45m in a 50km/h speed environment. This is also shown in Appendix C and is an acceptable outcome.

5.4 Car Park management

The use of boom gates as an access control measure has been considered in the context of the proposed car park design. Based on the anticipated traffic volumes, turnover rates, and the nature of the ticketed tourist attraction, the implementation of boom gates is not necessary for effective traffic management.

The car park layout has been designed to accommodate expected peak demand. Uncontrolled access is expected to facilitate smoother vehicle circulation and reduce potential delays, particularly during high visitation periods. Additionally, the absence of boom gates minimises infrastructure and maintenance requirements, contributing to a more efficient and user-friendly experience for visitors.

Should operational or commercial considerations—such as security, revenue collection, or restricted access—warrant further control measures, these can be addressed separately from the traffic engineering assessment. From a traffic performance and functionality perspective, the proposed design is considered sufficient without the need for boom gate infrastructure.

5.5 Pedestrian Crossings

A pedestrian path and new wombat crossing will connect the visitor car park and the proposed building. Austroads Guide to Road Design Part 4, Section 8.2.5 Raised Pedestrian (Wombat) Crossing states:

> *Wombat crossings are pedestrian (zebra) crossings placed on raised platforms of similar design to road humps. As such, wombat crossings provide pedestrians with priority to cross a road. The raised crossing*

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serves the purpose of slowing vehicles, as for a speed hump or platform, but also increases the visibility of pedestrians due to the increased height.

A new wombat crossing is proposed to provide connection between the factory workers car park and the factory itself. Due to the proximity of the existing crossing to the 2 new wombat crossings, the existing crossing will be removed.

The southern zebra crossing that links the traffic island with the Experience Centre will be removed to discourage pedestrian access via the Cadbury factory entrance.

A concept drawing of the proposed car park and pedestrian connections is provided in Appendix A.

The proposed wombat crossings are located approximately 53m apart, which is more than sufficient for 2 B-Doubles to store without impacts on the adjacent wombat crossing.

Austroads Guide to Traffic Management Part 8: Local Area Traffic Management, Section 8.2.1 Road Humps states:

The spacing of further road humps should be as uniform as possible allowing for side roads and vehicle crossings. Spacing of devices should not be less than 80 m and generally not more than 120 to 150 m.

The proposed western wombat crossing has been designed to reflect existing on-site conditions/ constraints.

Given that it is not proposed to relocate the existing eastern crossing, the western wombat crossing is proposed with a spacing of 53 metres rather than 80 metres. This is a result of the 80m being in the middle of the existing site access to the proposed visitor car park.

A distance of approximately 13m has been allowed between the access and the wombat crossing, which is sufficient for 2 vehicles to stop on the western side of the wombat crossing without impacting the site access.

These crossings are located on local roads in a low-speed environment and are considered to meet the intent of the Austroads Guide to Road Design Part 4, Section 8.2.5 Raised Pedestrian (Wombat) Crossing and Austroads Guide to Traffic Management Part 8: Local Area Traffic Management.

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6 Planning Scheme Response

C3.0 Road and Railway Assets Code

C3.5 Use Standards

C3.5.1 Traffic generation at a vehicle crossing, level crossing or new junction

Objective: To minimise any adverse effects on the safety and efficiency of the road or rail network from vehicular traffic generated from the site at an existing or new vehicle crossing or level crossing or new junction.

Acceptable Solutions	Performance Criteria
A1.1 For a category 1 road or a limited access road, vehicular traffic to and from the site will not require: (a) a new junction. (b) a new vehicle crossing; or (c) a new level crossing.	P1 Vehicular traffic to and from the site must minimise any adverse effects on the safety of a junction, vehicle crossing or level crossing or safety or efficiency of the road or rail network, having regard to: (a) any increase in traffic caused by the use. (b) the nature of the traffic generated by the use. (c) the nature of the road. (d) the speed limit and traffic flow of the road. (e) any alternative access to a road. (f) the need for the use. (g) any traffic impact assessment; and (h) any advice received
A1.4 Vehicular traffic to and from the site, using an existing vehicle crossing or private level crossing, will not increase by more than: (a) the amounts in Table C3.1; or (b) allowed by a licence issued under Part IVA of the Roads and Jetties Act 1935 in respect to a limited access road.	
A1.5 Vehicular traffic must be able to enter and leave a major road in a forward direction.	

Response: Complies with P1

(a) The projected increase in traffic is low and is estimated to have negligible impact on the road network. A traffic impact Assessment confirms the additional traffic will not result in congestion at the site or nearby junctions. This conclusion is supported by SIDRA modelling which indicates all assessed intersections operate at LOS A–C with post-development DOS values well within capacity.

(b) Traffic will primarily consist of passenger vehicles, with occasional coaches and heavy vehicles up to 12.5m long. The car park layout accommodates turning movements and include separate dedicated bays for parents with prams and accessible parking to the frontage of the site reducing conflict and circulation.

(c) The site is accessed via a sealed local road with low to moderate traffic volumes. The road has adequate width and sight distances to support safe ingress and egress. The access point is located away from bends and crests, minimising visibility risks.

(d) The posted speed limit is 50 km/h at Cadbury Road and 10km/h within the car parking area and internal accessways. Traffic flow is expected to be minimal, steady and managed through ticketing.

(e) No alternate access proposed

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(f) **The primary demographic for the site is families with children. To support this a focus have been placed to provide to increase separation from vehicle accessways and achieved through the provision of raised and protected pedestrian footpaths.**

(g) **A TIA has been prepared by a qualified transport engineer. Traffic generation will be low. The assessment concludes that the development will not have an appreciable impact on the safety or function of the road network.**

(h) **n/a**

C2.0 Parking and Sustainable Transport Code

C2.5 Use Standards

C2.5.1 Car parking numbers

Objective: That an appropriate level of car parking spaces are provided to meet the needs of the use.

Acceptable Solutions	Performance Criteria
A1 The number of on-site car parking spaces must be no less than the number specified in Table C2.1.	P1.1 The number of on-site car parking spaces for uses, excluding dwellings, must meet the reasonable needs of the use, having regard to: (a) the availability of off-street public car parking spaces within reasonable walking distance of the site. (b) the ability of multiple users to share spaces because of: (i) variations in car parking demand over time; or (ii) efficiencies gained by consolidation of car parking spaces. (c) the availability and frequency of public transport within reasonable walking distance of the site; (d) the availability and frequency of other transport alternatives. (e) any site constraints such as existing buildings, slope, drainage, vegetation and landscaping. (f) the availability, accessibility and safety of on-street parking, having regard to the nature of the roads, traffic management and other uses in the vicinity. (g) the effect on streetscape; and (h) any assessment by a suitably qualified person of the actual car parking demand determined having regard to the scale and nature of the use and development.
	P1.2 The number of car parking spaces for dwellings must meet the reasonable needs of the use, having regard to: (a) the nature and intensity of the use and car parking required.

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	(b) the size of the dwelling and the number of bedrooms; and (c) the pattern of parking in the surrounding area.
Response: Complies with P1.1 **(a) The provision of off-street parking for CEC visitors and staff is adequate. Although there is technical discretion regarding car parking requirements for evening events as outlined in Table C2.1, the proposal meets the permitted parking standards for its primary daytime operational scenario. This is further supported by a car parking demand assessment which demonstrated sufficient car parking for the expected vehicle demand. Ticketing arrangements will be used to actively manage travel modes and volumes, ensuring parking demand does not exceed available on-site supply.** **(b) The site is designed for a single tourism use with primarily ticketed demand and a small portion for public use. Efficiencies are achieved through a staggered arrival and departure pattern** **(c) Public transport services are limited in the immediate vicinity. The site is not located within walking distance of a regular bus route or rail station.** **(d) The primary transport to the site is via ferry with a secondary access via the roadway, though private vehicles and coaches.** **(e) No constraint encountered** **(f) Car parking will be provided along the frontage of the proposed building for pick-up/drop-off, parents with prams and people with disabilities. This parking will be on an internal one-way road with minimal traffic.** **(g) Car parking is rationalised within the existing car parking area and internal road with minimal impact to streetscape.** **(h) Car parking demand has been undertaken by qualified transport engineer with consideration of the scale nature of the tourism use, expected visitor volumes and peak periods.** **As no dwellings are proposed, P1.2 is not applicable**	

C2.5.2 Bicycle parking numbers

Objective: That an appropriate level of bicycle parking spaces are provided to meet the needs of the use.	
Acceptable Solutions	**Performance Criteria**
A1 Bicycle parking spaces must: (a) be provided on the site or within 50m of the site; and (b) be no less than the number specified in Table C2.1.	P1 Bicycle parking spaces must be provided to meet the reasonable needs of the use, having regard to: (a) the likely number of users of the site and their opportunities and likely need to travel by bicycle; and (b) the availability and accessibility of existing and any planned parking facilities for bicycles in the surrounding area.
Response: Complies with A1 **(a) Bicycle spaces are provided on site** **(b) 20 Bicycle parking spaces are proposed, above the Table C2.1 required rate of 18.**	

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C2.5.3 Motorcycle parking numbers

Objective: That the appropriate level of motorcycle parking is provided to meet the needs of the use.	
Acceptable Solutions	**Performance Criteria**
A1 The number of on-site motorcycle parking spaces for all uses must: (a) be no less than the number specified in Table C2.4; and (b) if an existing use or development is extended or intensified, the number of on-site motorcycle parking spaces must be based on the proposed extension or intensification, provided the existing number of motorcycle parking spaces is maintained.	P1 Motorcycle parking spaces for all uses must be provided to meet the reasonable needs of the use, having regard to: (a) the nature of the proposed use and development. (b) the topography of the site. (c) the location of existing buildings on the site. (d) any constraints imposed by existing development; and (e) the availability and accessibility of motorcycle parking spaces on the street or in the surrounding area.
Response: Complies with P1 **6 motorcycle parking spaces are proposed, matching the demand that is based on the expected travel characteristics of the site, as set out in Section 3.3 of this report.**	

C2.5.4 Loading Bays

Objective: That adequate access for goods delivery and collection is provided, and to avoid unreasonable loss of amenity and adverse impacts on traffic flows.	
Acceptable Solutions	**Performance Criteria**
A1 A loading bay must be provided for uses with a floor area of more than 1000m² in a single occupancy.	P1 Adequate space for loading and unloading of vehicles must be provided, having regard to: (a) the type of vehicles associated with the use. (b) the nature of the use. (c) the frequency of loading and unloading. (d) the location of the site. (e) the nature of traffic in the surrounding area. (f) the area and dimensions of the site; and (g) the topography of the site. (h) the location of existing buildings on the site; and (i) any constraints imposed by existing development.
Response: Complies with A1 **A single loading bay located east of the site is proposed to service the development and its various land uses. It is designed to accommodate vehicles up to 12.5 metres in length, which represents the largest vehicle expected to utilise the loading area.**	

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C2.6 Development Standards for Buildings and Works

C2.6.1 Construction of parking areas

Objective: That parking areas are constructed to an appropriate standard.

Acceptable Solutions	Performance Criteria
A1 All parking, access ways, manoeuvring and circulation spaces must: (a) be constructed with a durable all-weather pavement. (b) be drained to the public stormwater system, or contain stormwater on the site; and (c) excluding all uses in the Rural Zone, Agriculture Zone, Landscape Conservation Zone, Environmental Management Zone, Recreation Zone and Open Space Zone, be surfaced by a spray seal, asphalt, concrete, pavers or equivalent material to restrict abrasion from traffic and minimise entry of water to the pavement.	P1 All parking, access ways, manoeuvring and circulation spaces must be readily identifiable and constructed so that they are useable in all weather conditions, having regard to: (a) the nature of the use. (b) the topography of the land. (c) the drainage system available. (d) the likelihood of transporting sediment or debris from the site onto a road or public place. (e) the likelihood of generating dust; and (f) the nature of the proposed surfacing.
Response: Compliant with A1 **(a) The proposed parking, access, and circulation areas are constructed with durable, all-weather surfaces,** **(b) appropriately drained into public storm water system, and** **(c) surfaced by asphalt to restrict abrasion from traffic and minimise water entry to pavements**	

C2.6.2 Design and layout of parking areas

Objective: That parking areas are designed and laid out to provide convenient, safe and efficient parking.

Acceptable Solutions	Performance Criteria
A1.1 Parking, access ways, manoeuvring and circulation spaces must either: (a) comply with the following: (i) have a gradient in accordance with Australian Standard AS 2890 - Parking facilities, Parts 1-6. (ii) provide for vehicles to enter and exit the site in a forward direction where providing for more than 4 parking spaces. (iii) have an access width not less than the requirements in Table C2.2. (iv) have car parking space dimensions which satisfy the requirements in Table C2.3. (v) have a combined access and manoeuvring width adjacent to parking spaces not less than	P1 All parking, access ways, manoeuvring and circulation spaces must be designed and readily identifiable to provide convenient, safe and efficient parking, having regard to: (a) the characteristics of the site. (b) the proposed slope, dimensions and layout. (c) useability in all weather conditions; (d) vehicle and pedestrian traffic safety. (e) the nature and use of the development. (f) the expected number and type of vehicles. (g) the likely use of the parking areas by persons with a disability. (h) the nature of traffic in the surrounding area. (i) the proposed means of parking delineation; and

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the requirements in Table C2.3 where there are 3 or more car parking spaces. (vi) have a vertical clearance of not less than 2.1m above the parking surface level; and (vii) excluding a single dwelling, be delineated by line marking or other clear physical means; or (b) comply with Australian Standard AS 2890- Parking facilities, Parts 1-6.	(j) the provisions of Australian Standard AS 2890.1:2004 - Parking facilities, Part 1: Off-street car parking and AS 2890.2 -2002 Parking facilities, Part 2: Off-street commercial vehicle facilities
A1.2 Parking spaces provided for use by persons with a disability must satisfy the following: (a) be located as close as practicable to the main entry point to the building. (b) be incorporated into the overall car park design; and (c) be designed and constructed in accordance with Australian/New Zealand Standard AS/NZS 2890.6:2009 Parking facilities, Off-street parking for people with disabilities. 1	
Response: **Complies with A1.1** **(a) The car parking spaces, accessways, manoeuvring and gradient have been designed in accordance with AS 2890.** **Complies with A1.2** **(a) Spaces for persons with a disability are located at the frontage of the site separate from the main car park.** **(b) The accessible bays are incorporated into the overall car park layout, and will be provided with clear signage, line marking, and pedestrian pathways that connect to the building entrance. Their placement ensures visibility, ease of access, and minimal conflict with general traffic movements.** **(c) The accessible parking spaces have been designed in accordance with AS2890.6**	

C2.6.3 Number of accesses for vehicles

Objective: That: **(a) access to land is provided which is safe and efficient for users of the land and all road network users, including but not limited to drivers, passengers, pedestrians and cyclists by minimising the number of vehicle accesses;** **(b) accesses do not cause an unreasonable loss of amenity of adjoining uses; and** **(c) the number of accesses minimise impacts on the streetscape.**	
Acceptable Solutions	**Performance Criteria**
A1 The number of accesses provided for each frontage must: (a) be no more than 1; or (b) no more than the existing number of accesses, whichever is the greater	P1 The number of accesses for each frontage must be minimised, having regard to: (a) any loss of on-street parking; and (b) pedestrian safety and amenity. (c) traffic safety. (d) residential amenity on adjoining land; and

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	(e) the impact on the streetscape.
Response: Complies with A1 (b). No new accesses are proposed.	

C2.6.5 Pedestrian access

Objective: That pedestrian access within parking areas is provided in a safe and convenient manner.

Acceptable Solutions	Performance Criteria
A1.1 Uses that require 10 or more car parking spaces must: (a) have a 1m wide footpath that is separated from the access ways or parking aisles, excluding where crossing access ways or parking aisles, by: (i) a horizontal distance of 2.5m between the edge of the footpath and the access way or parking aisle; or (ii) protective devices such as bollards, guard rails or planters between the footpath and the access way or parking aisle; and (b) be signed and line marked at points where pedestrians cross access ways or parking aisles.	P1 Safe and convenient pedestrian access must be provided within parking areas, having regard to: (a) the characteristics of the site. (b) the nature of the use. (c) the number of parking spaces. (d) the frequency of vehicle movements. (e) the needs of persons with a disability. (f) the location and number of footpath crossings. (g) vehicle and pedestrian traffic safety. (h) the location of any access ways or parking aisles; and (i) any protective devices proposed for pedestrian safety.
A1.2 In parking areas containing accessible car parking spaces for use by persons with a disability, a footpath having a width not less than 1.5m and a gradient not steeper than 1 in 14 is required from those spaces to the main entry point to the building.	

Response:

Complies with P1

(a) Fits the site's characteristics and aligns with current conditions.

(b) Ensures tourists have a safe area designated to them.

(c) Provides parking spaces based on car parking assessment.

(d) Car park is designed for expected vehicle frequency, as per the car parking assessment.

(e) Disabled parking follows AS 2890.6 standards.

(f) Pedestrian paths safely connect tourists and staff for the Experience Centre to the car park.

(g) Safety measures, including fences, kerbs and line markings, will be provided to protect users.

(h) Parking aisles and access ways remain generally unchanged compared to the existing car park.

(i) Fences and kerbs and line markings will be provided to enhance pedestrian safety.

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C2.6.6 Loading bays

Objective: That the area and dimensions of loading bays are adequate to provide safe and efficient delivery and collection of goods	
Acceptable Solutions	**Performance Criteria**
A1 The area and dimensions of loading bays and access way areas must be designed in accordance with Australian Standard AS 2890.2–2002, Parking facilities, Part 2: Off-street commercial vehicle facilities, for the type of vehicles likely to use the site.	P1 Loading bays must have an area and dimensions suitable for the use, having regard to: (a) the types of vehicles likely to use the site. (b) the nature of the use. (c) the frequency of loading and unloading. (d) the area and dimensions of the site. (e) the topography of the site. (f) the location of existing buildings on the site; and (g) any constraints imposed by existing development.
A2 The type of commercial vehicles likely to use the site must be able to enter, park and exit the site in a forward direction in accordance with Australian Standard AS 2890.2 – 2002, Parking Facilities, Part 2: Parking facilities - Off-street commercial vehicle facilities.	P2 Access for commercial vehicles to and from the site must be safe, having regard to: (a) the types of vehicles associated with the use. (b) the nature of the use. (c) the frequency of loading and unloading. (d) the area and dimensions of the site. (e) the location of the site and nature of traffic in the area of the site. (f) the effectiveness or efficiency of the surrounding road network; and (g) site constraints such as existing buildings, slope, drainage, vegetation, parking and landscaping.
Response: **Complies with A1** **The proposed loading bay within the development has been designed in accordance with AS 2890.2 as shown on plans outlined appendix B; to accommodate a 12.5-metre truck, which is the largest vehicle anticipated to use the loading area.** **Complies with A2** **The design enables the truck to enter and exit the site in a forward motion, ensuring safe manoeuvring without disrupting the flow of traffic in accordance with AS 2890.2.**	

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7 Conclusion

The following conclusions are made based on the analysis and discussion set out in this report:

- Trips to the subject site will primarily be made by ferry. Other trips will be made by coach, and the remainder will be made by car.
- We expect the total car parking demand of all uses on the wider subject site to be approximately 360 car spaces during the peak hour on the peak day of the year (225 spaces for existing factory employees and 135 spaces for the proposed development). These demands will be accommodated in separate parking areas in the existing car parking (303 spaces for factory employees and 129 spaces for the proposed development) as well as 9 parents with pram spaces, 3 standing/drop-off/pick-up spaces and 3 DDA spaces located at the frontage of the proposed building. The parking provision is acceptable on this basis.
- A traffic impact assessment has been conducted which indicates that the proposed development will not have an appreciable impact on the road network.

The transport characteristics of the proposes development are acceptable, on this basis.

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Appendix A Car Park Layout

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Appendix B Swept Path Checks

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Appendix C Sightline Assessment

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Coastal Erosion Hazard Assessment Report

‘Cadbury Experience’ Project - Windermere Bay, Claremont

Prepared for

Chocolate Experience No. 2 (Simon Currant & Associates and partner investors)

Client representative

Michelle Mhemba

Date

08 September 2025

Rev 00



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Appendix A — Slope Stability Report (by pitt&sherry)

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Prepared by — Noel Carroll		**Date —** 8 September 2025
Reviewed by — Andrew Tyson		**Date —** 8 September 2025
Authorised by — Kieran O'Connor		**Date —** 8 September 2025

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
A	Draft issue for comment	NDC	AT	KOC	4/12/2024
B	Draft updated for comment	NDC	AT	KOC	29/08/2025
00	Final Issue	CH / DW	AT	KOC	08/09/2025

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Executive Summary

This Coastal Erosion Hazard Report and any supporting information has been prepared in accordance with the requirements of the relevant Code in the Tasmanian Planning Scheme and in accordance with the latest Director's Determination (v1.2, September, 2021).

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1. Introduction

Simon Currant & Associates Pty Ltd (SCA) is managing the proposal to develop the 'Cadbury Experience Project' at the Mondelez factory site and within the adjacent Windermere Bay (the Site).

Building works are proposed and the redevelopment requires planning approval. The Tasmanian Planning Scheme (TPS) that is in force for the Glenorchy City Council (GCC) municipality has planning overlays for various constraints on the subject property. This report addresses the potential of the Site for vulnerability to coastal erosion. A separate Coastal Inundation Hazard Report about the Site has been prepared (pitt&sherry, 2025).

2. Scope of works / background

The scope of services undertaken by pitt&sherry for this assessment and Coastal Erosion Hazard Report has included the following activities:

- Visit the Site and view the foreshore adjacent to Windermere Bay
- Consider the report regarding the geotechnical investigations carried out at the Site, which has been prepared by a pitt&sherry geologist
- Examine the survey drawing from a Registered Surveyor that shows current levels on the Site that has been provided to pitt&sherry
- Examine the survey drawing from a Registered Surveyor that shows current seabed (river bed) levels within Windermere Bay, at the Site, that has been provided to pitt&sherry; and
- Undertake a desktop study of the publicly available information re: coastal erosion that is specific to the Site.

The following services were specifically EXCLUDED from the scope undertaken by pitt&sherry:

- Obtaining site measurements
- Creation of digital and physical modelling; and
- Interpretation of the Tasmanian Planning Scheme and/or the provision of planning advice.

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3. About the practitioner and method

3.1 Practitioner details

The information below is to be completed by each person responsible for preparing or verifying this report.[1]

Lead / coordinating consultant name (must be an individual)	Noel Carroll
Academic Qualification/s	BEng, MEngSc (UNSW, Coastal Engineering and Management), CPEng, MIEAust., NER, RPEQ
Relevant Experience	I have been involved with coastal engineering projects since 1985
Business name and address	pitt&sherry (Operations) Pty. Ltd., Level 1, 199 Macquarie Street, Hobart, 7000.
Contact phone number	03 62 101400
Email address	ncarroll@pittsh.com.au
Signature	
Date	5/09/2025
Supporting consultant name (must be an individual)	Andrew Tyson, Geologist, pitt&sherry (Operations) Pty. Ltd.

[1] Ex template related to the Director's Determination (v1.2, September, 2021).

3.2 Methodology

This report has been prepared in accordance with the Department of Justice (CBOS) Director's Determination – Coastal Erosion Hazard Areas v1.2, dated 27 September 2021, and generally following the format / pro forma that was prepared by the State Government for that purpose.

A survey drawing of the Site has been provided to pitt&sherry which shows existing levels and the proposed extent of the foreshore and seabed bathymetry, at the Site, prepared by PDA Land & Engineering Surveyors.

4. Information Considered

4.1 Site layout

The conceptual layout of the Site is shown in the proposed development components diagram shown in Figure 1. This information was prepared by Cumulus Architects and provided to pitt&sherry by SCA.

4.2 The proposed redevelopment and TPS erosion overlays

4.2.1 Proposed redevelopment

It is proposed to develop the Site for a visitor and tourist facility that is dubbed the 'Cadbury Experience'. The proposal will likely require the construction of new buildings, piers/columns and the provision of a berth for a high-speed catamaran ferry vessel.

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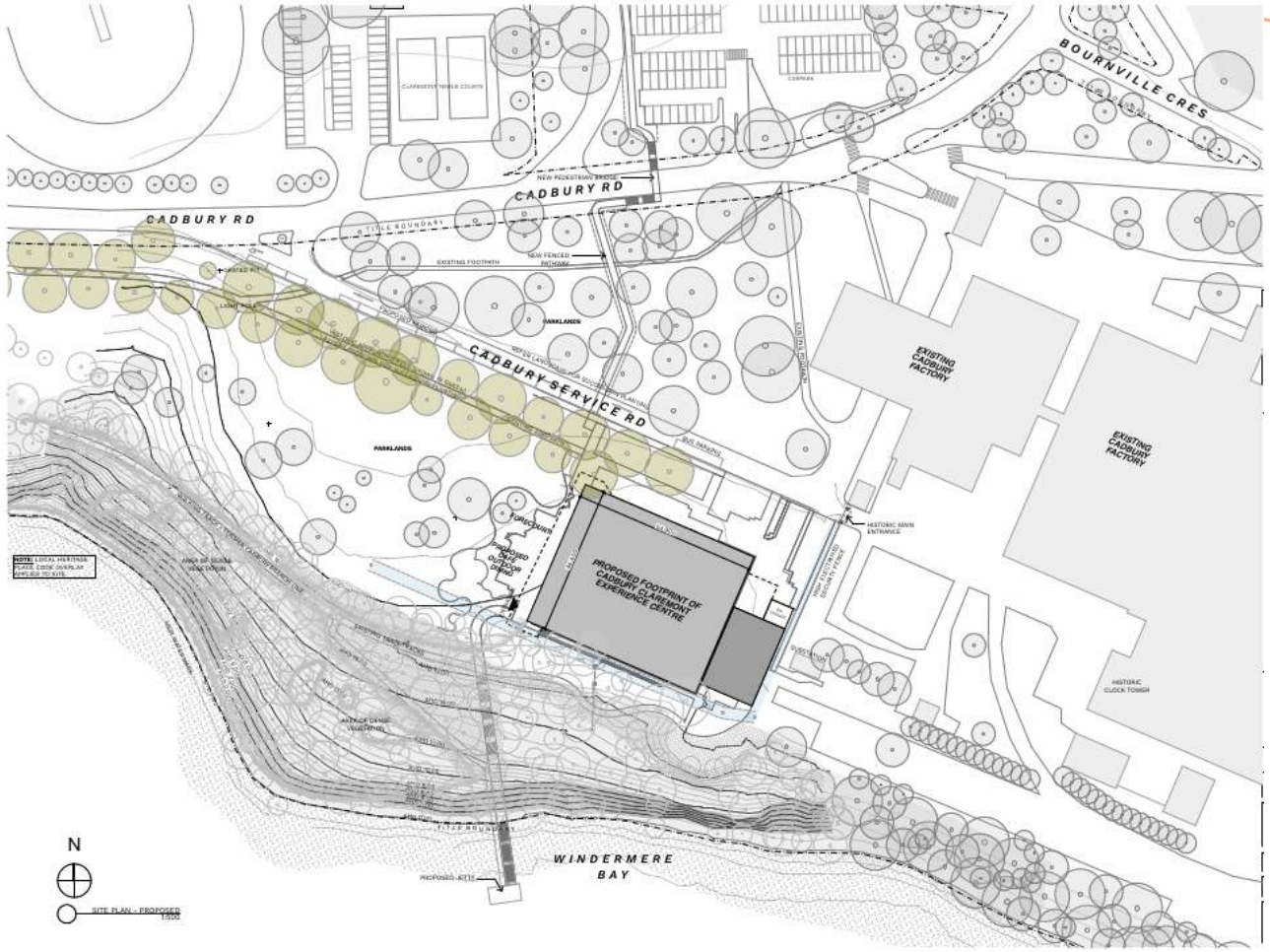


Figure 1: Proposed development components diagram in plan view at the Site (Source – Cumulus Architects, 2025)

4.2.2 Coastal erosion area overlay

Mapping in 'theLIST' – a geospatial reference by Land Tasmania – includes the 'Coastal erosion area' overlay, relevant to the Site, and that is shown in Figure 2 for Category: Land Parcel and Property; Planning; Sub-category: Tasmanian Planning Scheme (TPS) – Code Overlay; Layer: Coastal Erosion Hazard Bands.

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Figure 2: Low coastal erosion hazard band from the TPS Code Overlay as indicated by the solid yellow fill (Source – 'theLIST', 2025)

A medium landslip hazard band is identified as another Code Overlay that pertains to the foreshore (scarp) at the Site. That hazard has been addressed by Andrew Tyson, Associate Engineering Geologist, pitt&sherry in separate reports.

Mapping in 'theLIST' also has information on the area of regression and slump hazard near the Site, as Category: Coastal Vulnerability; Layer: Coastal Erosion Hazard Bands 20161201 and this is shown in Figure 3.

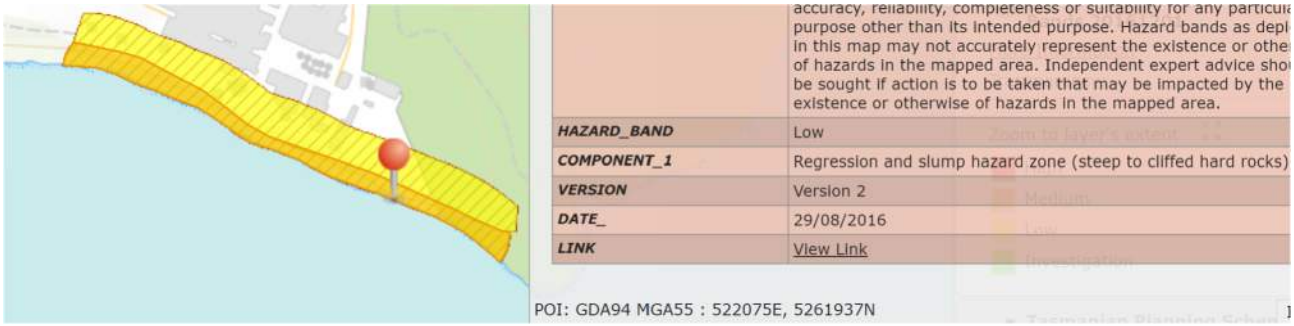


Figure 3: Low hazard band regression and slump zone as indicated by the solid orange fill (Source – 'theLIST', 2025)

For the purposes of this investigation, it is assumed that information from the TPS Code Overlay takes precedence over Coastal Vulnerability Hazard bands mapping '20161201' (2016) in consideration of the extent of the coastal erosion hazard and on the Site.

As shown in Figure 2, part of the site is situated within the Low Coastal Erosion Band.

4.2.3 Shoreline erodibility – 'High-level' (in overview) assessment

The 'Smartline Basic' assessment of the shoreline erodibility is shown in Figure 4. This is a 'High-level' (in overview) assessment only.

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4.3 Geotechnical investigations

A slope stability and ground condition assessment had been undertaken for the Site and reports about that provided by the pitt&sherry Principal Engineering Geologist, Andrew Tyson, attached as Appendix A. The proposed location of the site has shifted since the original development of these reports, and the slope stability report has been updated to match. The conclusions of the reports are that tolerable risks can be achieved and maintained provided certain measures are taken.

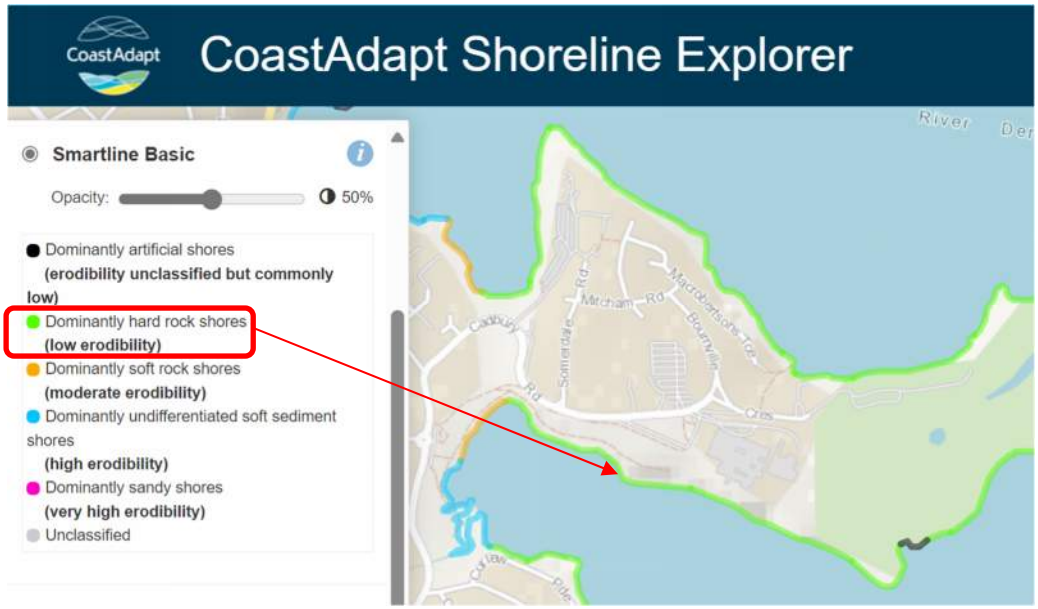


Figure 4: Classification of the shoreline at and near the Site (Source – 'CoastAdapt', 2025)

4.4 Site levels

Levels on the Site are derived from the PDA survey. Supplementary information was obtained as needed from 'theLIST' and from the online database 'ELVIS' (Geoscience Australia, 2022) that is publicly available from at Digital Elevation Data | Geoscience Australia (ga.gov.au)

All levels denoted herein are in reference to Australian Height Datum (*AHD83*). Figure 5 shows an image of the contoured elevation levels at the Site.

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Figure 5: Aerial photo of the Site showing the 5 m, 10 m and 15 m land contours (Source – 'theLIST', 2025)

4.5 Site observations and historical imagery

4.5.1 Site visit by the author

It is proposed to develop the Site for a visitor and tourist facility that is dubbed the 'Cadbury Experience'. A visit to the Site was undertaken on the 16 October 2024 to view the terrain and current form of the beach, generally.

Figure 6 is a photo of the shoreline looking eastwards from the Foreshore Reserve, near the Claremont Cenotaph, at the head of Windermere Bay.

Figure 7 is a photo of the subject area for the 'Cadbury Experience' from across Windermere Bay near Curlew Parade.

4.5.2 Site visit by Andrew Tyson, Associate Engineering Geologist

Andrew Tyson visited the Mondelez Factory (more recently) to inspect the existing terrain near to the Site.

Figure 8 is a photo provided by Andrew showing the shoreline scarp beside the existing jetty near to the subject area for the 'Cadbury Experience' that was taken during his visit.

The findings by Andrew Tyson post his visit to the Site are included in pitt&sherry document T-P-23.1303-GEO-REP-001.

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Figure 6: Photo of the shoreline along Cadbury Point from the head of Windermere Bay (Source – pitt&sherry, 2024)



Figure 7: Photo of the shoreline at the subject Site on Cadbury Point from across Windermere Bay (Source – pitt&sherry, 2024)

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Figure 8: Photo of the shoreline scarp at the existing jetty near the subject Site on Cadbury Point (Source – pitt&sherry, 2024)

4.6 Consideration of risk vs use

4.6.1 Engineer's assessment of the Tasmanian Planning Scheme

The interpretation of and assessment against the provisions in the Tasmanian Planning Scheme (TPS) relevant to coastal erosion has been undertaken by pitt&sherry and is documented herein.

It is understood from the provisions within TPS section C10.4 that the proposed development at the Site is exempt from the Coastal Erosion Hazard Code because it is:

- Not a critical use, hazardous use or vulnerable use
- The Site is NOT located within an actively mobile landform
- Not located within a high coastal erosion hazard band; and
- Not for coastal protection works.

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5. Opinions about the proposal

Likelihood of the proposed use or development (a dwelling) to cause or contribute to the occurrence of coastal erosion on the site or adjacent land

- Tolerable but unlikely, or nil.

Can the proposed use or development achieve and maintain a tolerable risk for the intended life of the use or development, having regard to the following Q&A matrix?

The nature, intensity and duration of the use	<Does the nature, intensity, and/or duration of the proposed use make it more or less able to achieve and maintain a tolerable risk in relation to coastal erosion?> **Less able, very slightly (if at all)**
The type, form and duration of any development	<Does the type, form, and/or intended duration of the proposed development make it more or less able to achieve and maintain a tolerable risk in relation to coastal erosion?> **Less able, very slightly (if at all)**
The likely change in the risk across the intended life of the use or development	<How is the coastal erosion risk likely to change over time? How will the expected change in risk over time impact the ability of the proposed use or development to achieve and maintain a tolerable risk for the intended life of the use or development?> **The risk of coastal erosion will increase over time due to the projected sea level rise that could occur on the coast at Glenorchy City Council. The expected risk of coastal erosion is managed by hazard reduction measures for the buildings and/or works at the Site**
The ability to adapt to a change in the level of risk	<Will the proposed use or development be able to adapt to changes in coastal erosion risks?> **Yes (by suitable design methods)**
The ability to maintain access to utilities and services	<Will the risk of erosion prevent the proposed use or development from being able to maintain access to utilities and services such as water, transport, electricity, or telecommunications infrastructure for the intended life of the use or development?> **Unlikely (by suitable design methods)**
The need for specific coastal erosion hazard reduction or protection measures on the site [2]	<Will specific on-site hazard reduction or protection measures be necessary to enable the proposed use or development to achieve and maintain a tolerable risk for the intended life of the use or development?> **No**
The need for coastal erosion reduction or protection measures beyond the boundary of the site [2]	<Will hazard reduction or protection measures be necessary beyond the boundary of the site to enable the proposed use or development to achieve and maintain a tolerable risk for the intended life of the use or development?> **No**
Any coastal erosion management plan in place for the site or adjacent land [2]	<If there is currently a coastal erosion management plan in place for the site or adjacent land, does it contain/require adequate hazard reduction or protection measures to enable the proposed use or development to achieve and maintain a tolerable risk for the intended life of the use or development?> **I am not aware of any existing coastal erosion management plan that is in place for the site at the time of writing.**

Any advice relating to the ongoing management of the use or development?

- No

Is the use or development located on an actively mobile landform within the coastal zone?

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☐ Yes ☒ No

Are there any conclusions relating to any matter specifically required by Performance Criteria from the Coastal Inundation Hazard Code (C10.6)?

- No.

6. Conclusions

The Site is situated within the Low Coastal Erosion Hazard Band according to the TPS. However, the present development proposal is deemed to be exempt from the provisions of the TPS regarding the mapped coastal erosion hazard and the provisions therein.

Attached geotechnical reports demonstrate that tolerable risks from coastal erosion can be achieved and maintained, provided that the jetty and connecting structures are designed to accommodate potential future shoreline regression. Furthermore, structure footings should be located outside the landslip hazard zone, and walkways enclosed as appropriate to mitigate risks associated with rockfall. No detailed drawings for proposed buildings/works at the Site have been provided to pitt&sherry. Nevertheless, providing that all buildings and/or works at the Site are designed and constructed clear of the foreshore it is possible to achieve and maintain a tolerable risk from coastal erosion for the expected life of the development through to 2100.

The information presented in the preceding section of this report demonstrates that either a zero or negligible risk is likely during the future use of and development at the Site.

7. References

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Slope Stability Report

Appendix A

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Cadbury Experience Project

Slope Stability Report

Prepared for

Chocolate Experience No. 2 (Simon Current and Associates and partner investors)

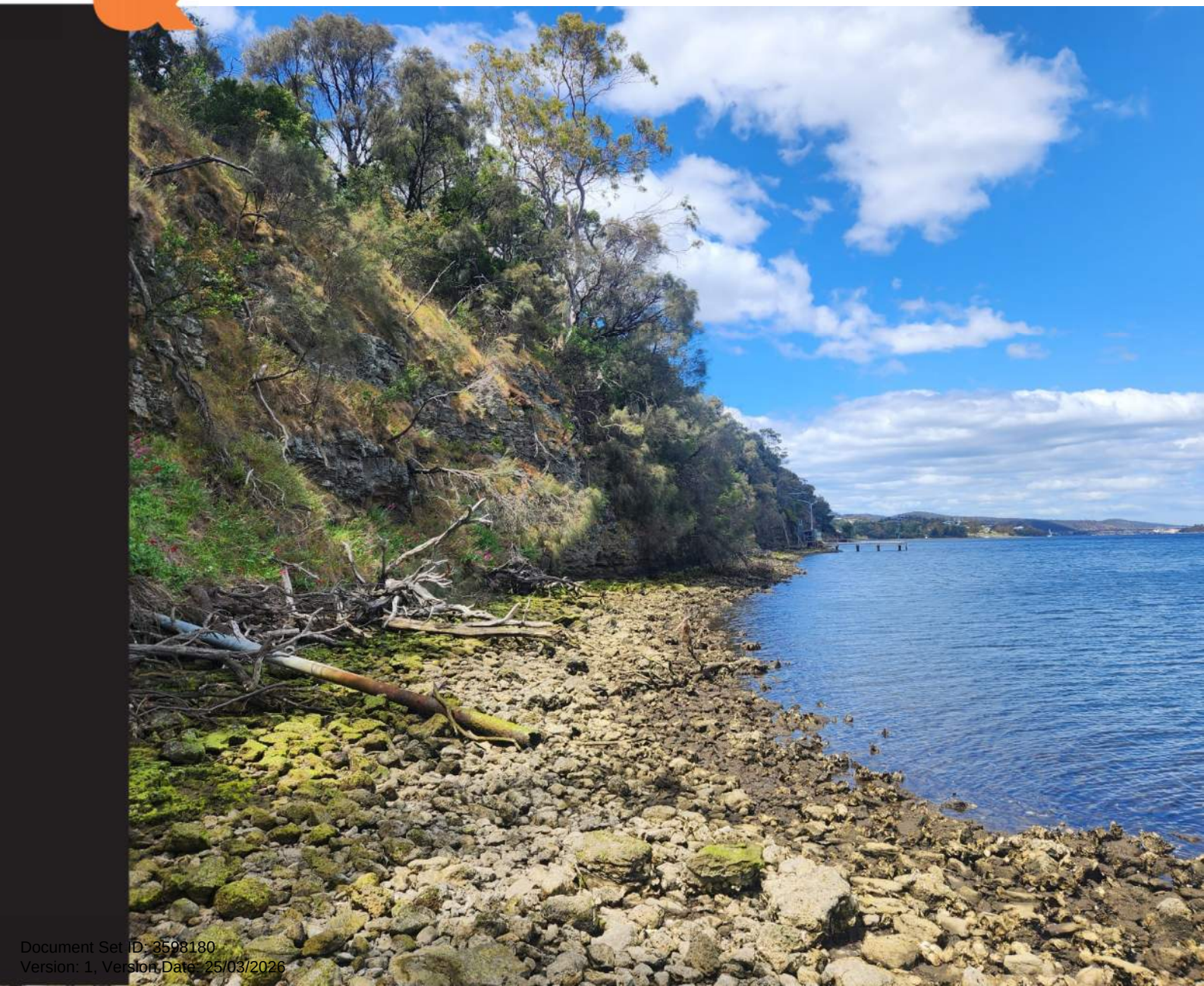
Client representative

Michelle Mhemba

Date

09 September 2025

Rev02



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Prepared by — Andrew Tyson		**Date —** 29 August 2025
Reviewed by — Kieran O'Connor		**Date —** 29 August 2025
Authorised by — Kieran O'Connor		**Date —** 29 August 2025

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
00	Final	AT	NP	NP	27/11/2024
01	Amended for new building, jetty and walkway locations	AT	KOC	KOC	29/8/2025
02	Minor amendment to wording	AT	KOC	KOC	9/9/2025

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1. Purpose

The primary purpose of this report is to demonstrate that the proposed Cadbury Experience Project can comply with the applicable provisions of the Tasmanian Planning Scheme - Glenorchy.

The proposed development consists of a building and associated infrastructure on a currently unoccupied part of the Cadbury site, near the coastal cliffs overlooking Windermere Bay. Additionally, the concept includes a new jetty and pathway up to the site of the Chocolate Experience building.

The assessments below are separated into two main sections; one for the building and nearby infrastructure, and one for the jetty and pathway.

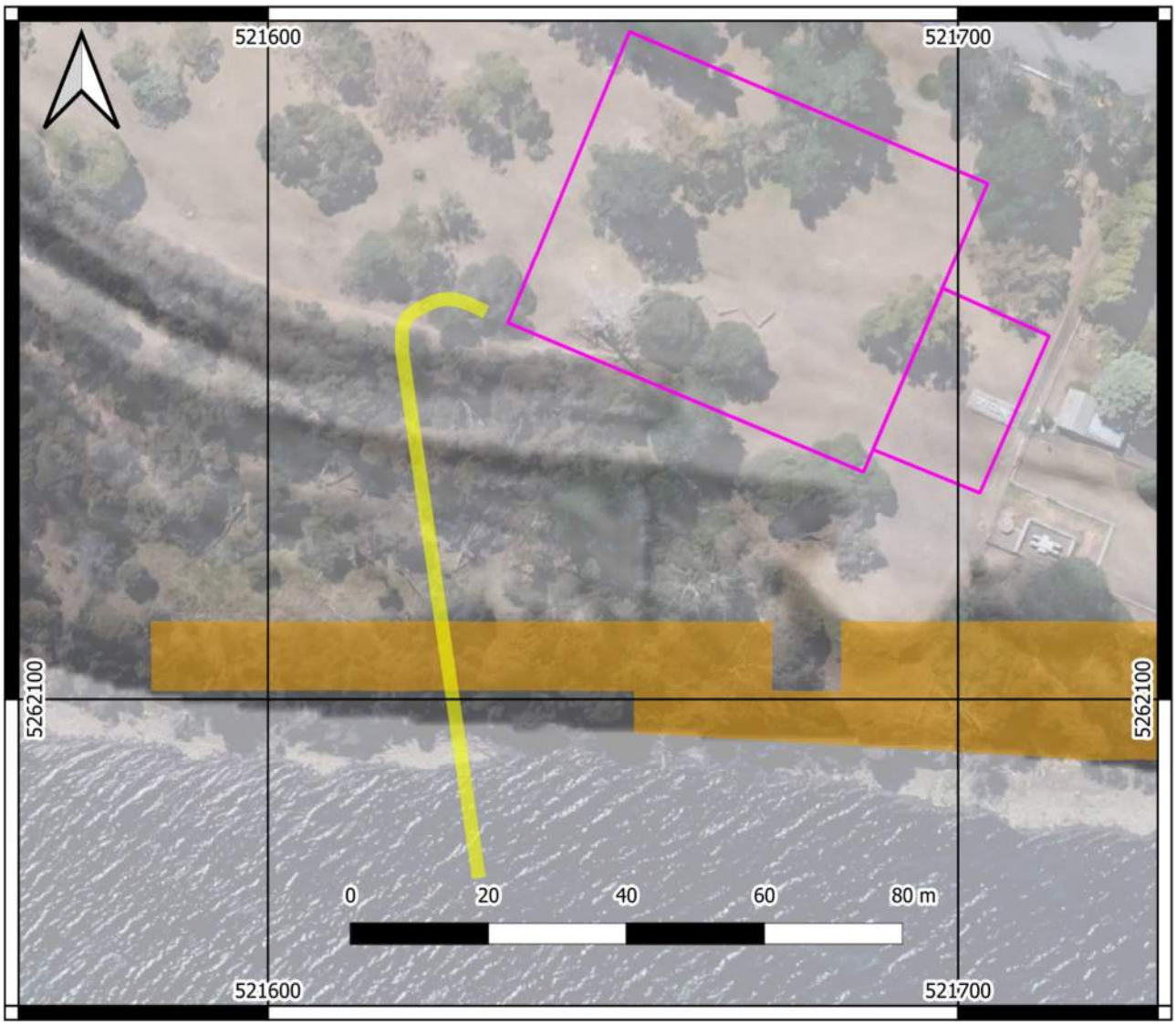


Figure 1: Site plan showing proposed building envelope (pink); walkway option (yellow); medium landslide hazard band in orange

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2. Landslip Risk Assessment

The section of medium landslide hazard band identified in Figure 1 above is further defined as “rockfall susceptibility source and runout area 34°” in the Landslide Planning Map – Components layer accessed through the ‘LISTmap’ website. This area has been defined by an algorithm based on the underlying geology and the slope angle at the site.

The area at the top of the cliffs has been mapped as Cenozoic age conglomerate and sandstone, while the cliffs are mapped as basalt. Both of these lithologies were observed on site, with the additional note that the basalt was extremely vesicular (extensive gas bubbles) and comprised of several basalt flows stacked on top of each other. The basalt flows at the base of the cliffs appear to have erupted underwater, and show extremely vesicular centres which have become the focus of erosion. The highly vesicular nature of the basalt increases the rate at which it erodes following exposure to air and water, and these erosive areas lead to new rockfall sites.

2.1 Cadbury Experience Area

The area where the Cadbury Experience building is proposed slopes gently towards the south. Areas in the vicinity have been modified by previous cut and fill works over the years, but the current proposed building envelope does not intersect any areas that are interpreted to have significant fill thickness.

There are no indications of instability in or near the proposed building envelope.

When designing the Cadbury Experience it will be important to ensure that foundations are extended into competent rock, and it is recommended that investigations are extended a suitable distance below founding layers as the basalt shows a propensity for voids and other strength changes. These recommendations will be most appropriately considered during the detailed design stage.

2.2 Jetty and Walkway

The proposed jetty is to be situated a short distance offshore to the south of the proposed Cadbury Experience buildings. Given the distance from the cliff edge, it is unlikely that rockfall or other stability issues will affect this location. The cliff edges around much of the coast below the Cadbury site are unstable and show many examples of recent rockfall (Figure 2). Any significant works undertaken from the coast in the vicinity of the proposed jetty location should be preceded by scaling works to reduce the risk of rockfall impacting on personnel working in the area. The risk has not been quantified at this point due to the lack of information regarding how much temporal exposure may be required for any works, however it is anticipated that a suitable scaling programme will be sufficient to keep risks in the tolerable to acceptable range.

The design for the walkway incorporates offshore stairs to bring pedestrians above the level of the cliff top before the shoreline is reached. Once the walkway reaches land, the pathway up to the proposed Cadbury Experience site proceeds along moderately steep slopes that do not show surface rock. As such, rockfall exposure in this section is considered very low.

There is potential for rockfall to impact on the supports for the elevated part of the walkway. This risk will be most appropriately considered during the detailed design stage when the locations of the supports are determined.

As with the jetty construction, any works undertaken from the coast in the vicinity of the proposed jetty location should be preceded by scaling works to reduce the risk of rockfall impacting on personnel working in the area. The risk has not been quantified at this point due to the lack of information regarding how much temporal exposure may be required for any works, however it is anticipated that a suitable scaling programme will be sufficient to keep risks in the tolerable to acceptable range.

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Figure 2: Recent rockfall on the shoreline beside Cadbury

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3. Landslide Code

As the planning assessment below demonstrates that the proposed development complies with the applicable standard, the proposal can reasonably be considered to be consistent with the purpose of the code, which is:

- C15.1.1 To ensure that a tolerable risk can be achieved and maintained for the type, scale and intensity and intended life of use or development on land within a landslip hazard area.

3.1 Use Standards

The uses standards are not applicable for the following reason:

- The proposed use is not a critical, hazardous or vulnerable use, so it is exempt under Clause C15.4.1 (a)

3.2 Development Standards

The following development standard does not apply:

- C15.7.1 Subdivision within a landslip hazard area (the proposal does not include subdivision).

C15.6.1 Building and works within a landslip hazard area

Objective: That building and works on land within a landslip hazard area can:

(a) minimise the likelihood of triggering a landslip event; and
(b) achieve and maintain a tolerable risk from a landslip.

Acceptable Solution	Performance Criteria
A1 No acceptable solution.	P1.1 Building and works within a landslip hazard area must minimise the likelihood of triggering a landslip event and achieve and maintain a tolerable risk from landslip, having regard to: (a) the type, form, scale and intended duration of the development; (b) whether any increase in the level of risk from a landslip requires any specific hazard reduction or protection measures; (c) any advice from a State authority, regulated entity or a council; and (d) the advice contained in a landslip hazard report. P1.2 A landslip hazard report also demonstrates that the buildings and works do not cause or contribute to landslip on the site, on adjacent land or public infrastructure. P1.3

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	If landslip reduction or protection measures are required beyond the boundary of the site the consent in writing of the owner of that land must be provided for that land to be managed in accordance with the specific hazard reduction or protection measures.

Assessment

The proposed development satisfies P1.1 for the following reasons:

(a) The foundations for the proposed Chocolate Experience are outside the landslide hazard zones, as is the majority of the walkway. These are intended to be permanent structures.
(b) The rockfall hazard associated with the construction of the jetty and walkway is likely to be managed by scaling. The resultant risk if such measures are planned and executed appropriately will be tolerable, and this risk level will be able to be maintained.
(c) No advice has been provided by a State authority, regulated entity or a council.
(d) The advice contained in this landslip hazard report can be considered by the planning authority.

The proposed works do not cause or contribute to landslip on the site, on adjacent land or public infrastructure because there is shallow rock interpreted that can provide suitable founding for construction of the proposed structures. No steepening of the existing slope would be undertaken and therefore the likelihood of instability does not increase. Therefore, the proposal satisfies P1.2.

As no landslip reduction or protection measures are required beyond the boundary of the site, P1.3 is not applicable.

Name and Signature	Role and qualifications	Date
Andrew Tyson	Associate Engineering Geologist with over 20 years' experience	28/08/2025

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Cadbury Experience Project

Slope Stability Report

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Newcastle
Devonport

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Coastal Erosion Hazard Assessment Report

‘Cadbury Experience’ Project – Windermere Bay, Claremont

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Coastal Inundation Hazard Assessment Report

‘Cadbury Experience Project’ - Windermere Bay, Claremont

Prepared for

Chocolate Experience No.2 (Simon Currant & Associates and partner investors)

Client representative

Michelle Mhemba

Date

09 September 2025

Rev 00



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Prepared by — Drew Wilson		**Date —** 9 September 2025
Reviewed by — Wesley Heckendorf		**Date —** 9 September 2025
Authorised by — Kieran O'Connor		**Date —** 9 September 2025

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
A	Draft issue for comment	NDC			5/12/2024
B	Draft issue for discussion	NDC			24/07/2025
C	Draft issue for review	DW			29/08/2025
00	Final	CH / DW	WH	KOC	08/09/2025

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Executive Summary

This Coastal Inundation Hazard Assessment Report and any supporting information has been prepared in accordance with the requirements of the relevant Code in the Tasmanian Planning Scheme and in accordance with the latest Director's Determination (v1.2, September 2021).

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1. Introduction

Simon Currant & Associates Pty Ltd (SCA) is proposing the development of the 'Cadbury Experience Project' at the Mondelez factory site and within the adjacent Windermere Bay (the Site).

Building works are proposed and the redevelopment requires planning approval. The Tasmanian Planning Scheme (TPS) that is in force for the Glenorchy City Council (GCC) municipality has planning overlays for various constraints on the subject property. This report addresses the potential of the Site for vulnerability to coastal inundation. A separate Coastal Erosion Hazard Assessment Report about the Site has been prepared (pitt&sherry, 2024).

2. Scope of works / background

The scope of services undertaken by pitt&sherry for this assessment and Coastal Inundation Hazard Report has included the following activities:

- Visit the Site and view the foreshore adjacent to Windermere Bay
- Examine the survey drawing from a Registered Surveyor that shows current levels on the Site that has been provided to pitt&sherry
- Examine the survey drawing from a Registered Surveyor that shows current seabed (riverbed) levels within Windermere Bay, at the Site, that has been provided to pitt&sherry; and
- Undertake a desktop study of the publicly available information re: coastal inundation that is specific to the Site.

The following services were specifically EXCLUDED from the scope undertaken by pitt&sherry:

- Obtaining site measurements
- Creation of digital and physical modelling; and
- Interpretation of the Tasmanian Planning Scheme and/or the provision of planning advice.

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3. About the practitioner and method

3.1 Practitioner details

The information below is to be completed by each person responsible for preparing or verifying this report.[1]

Lead / coordinating consultant name (must be an individual)	Noel Carroll
Academic Qualification/s	BEng, MEngSc (UNSW, Coastal Engineering and Management), CPEng, MIEAust., NER, RPEQ
Relevant Experience	I have been involved with coastal engineering projects since 1985
Business name and address	pitt&sherry (Operations) Pty. Ltd., Level 1, 199 Macquarie Street, Hobart, 7000.
Contact phone number	03 62 101400
Email address	ncarroll@pittsh.com.au
Signature	
Date	08/09/2025
Supporting consultant name (must be an individual)	Drew Wilson, Experienced Engineer (Coastal), pitt&sherry (Operations) Pty. Ltd.

3.2 Methodology

This report has been prepared in accordance with the Department of Justice (CBOS) Director's Determination – Coastal Inundation Hazard Areas v1.2, dated 27 September 2021, and generally following the format/pro forma that was prepared by the State Government for that purpose.

A survey drawing of the Site has been provided to pitt&sherry which shows existing levels and the proposed extent of the Site prepared by PDA Land & Engineering Surveyors.

A survey drawing of the riverbed bathymetry adjacent to the Site has been provided to pitt&sherry which shows existing levels around the proposed extent of the Site prepared by PDA Land & Engineering Surveyors.

4. Information Considered

4.1 Site layout

The conceptual layout of the Site is shown in the proposed development components diagram shown in Figure 1. This information was prepared by Cumulus Architects and provided to pitt&sherry by SCA.

4.2 The proposed redevelopment and TPS inundation overlays

4.2.1 Proposed redevelopment

It is proposed to develop the Site for a visitor and tourist facility that is dubbed the 'Cadbury Visitor Experience'.

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The proposal will likely require the construction of new buildings, piers/columns, jetty, and the provision of a berth for a high-speed catamaran ferry vessel.

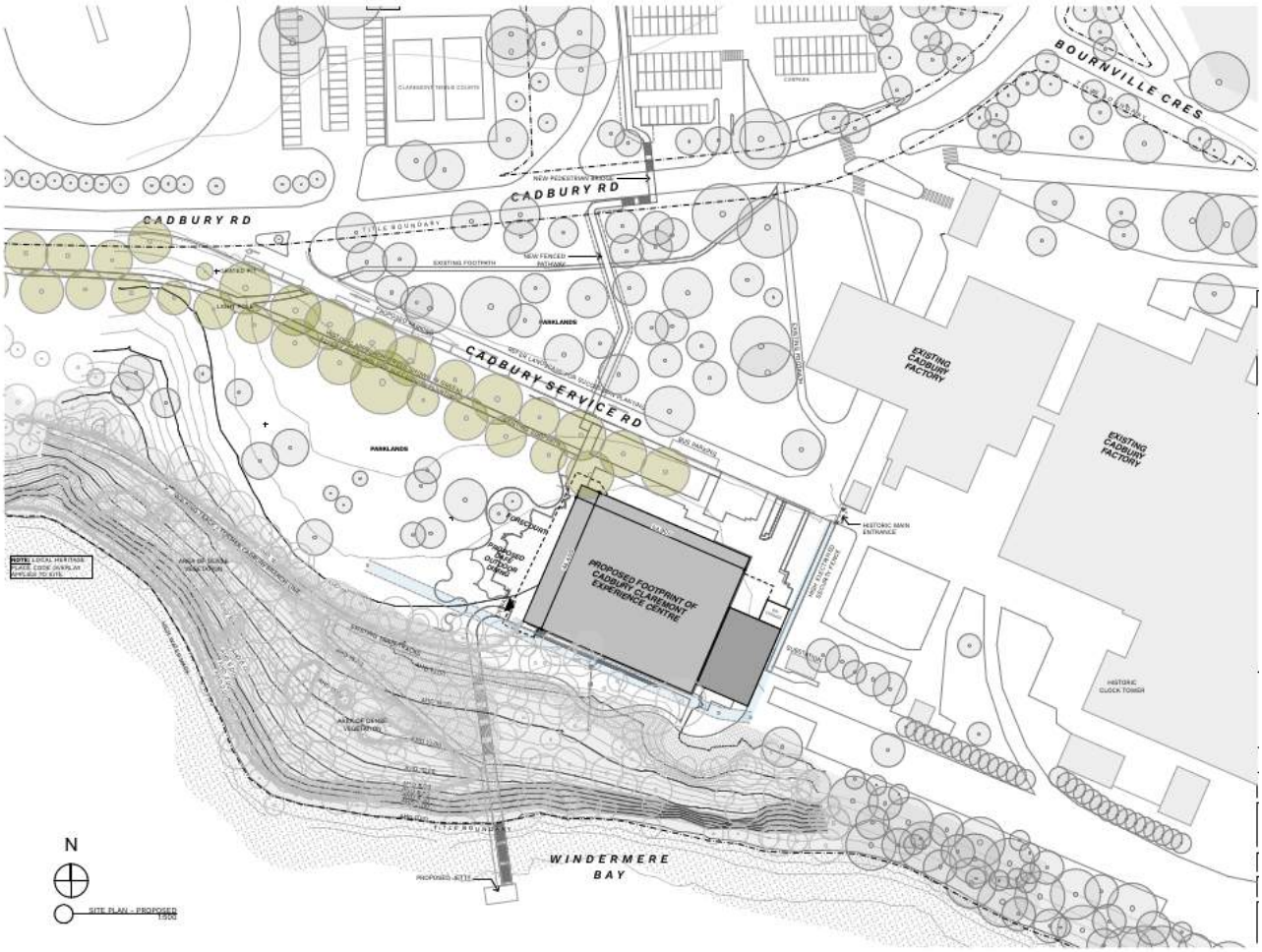


Figure 1: Proposed development components diagram in plan view at the Site (Source – Cumulus Architects, 2025)

4.2.2 Coastal inundation area overlay

Mapping in 'theLIST' – a geospatial reference by Land Tasmania – includes the 'Coastal inundation area' overlay, relevant to the Site, and that is shown in Figure 2 for Category: Land Parcel and Property; Planning; Sub-category: Tasmanian Planning Scheme (TPS) – Code Overlay; Layer: Coastal Inundation Hazard Bands.

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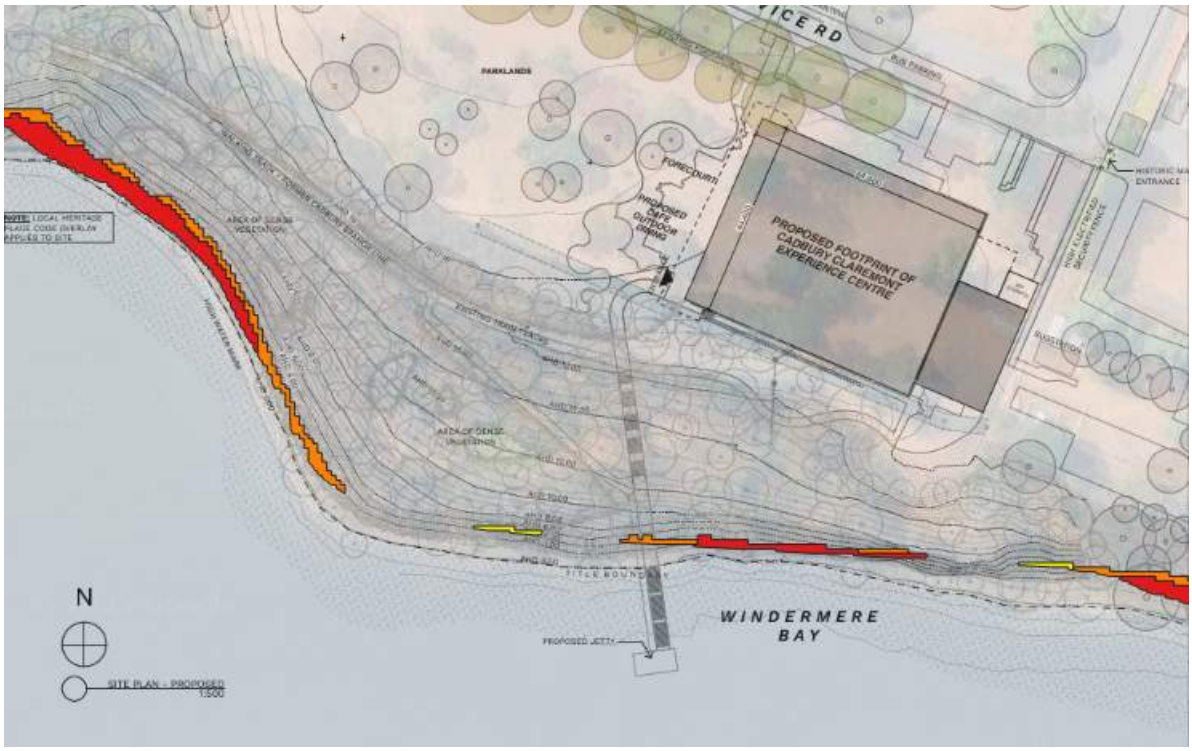


Figure 2: High (red), medium (orange) and low (yellow) coastal inundation hazard bands from the TPS Code Overlay (Source – 'theLIST', 2025)

Mapping in 'theLIST' also has information about the area inundation hazard at the Site, as Category: Coastal Vulnerability; Layer: Coastal Inundation Hazard Bands 20161201. For the purposes of this investigation, it is assumed that information from the TPS Code Overlay takes precedence over Coastal Vulnerability Hazard bands mapping '20161201' (2016) in consideration of the extent of the coastal inundation hazard at the Site.

As shown in Figures 2 and 3, foreshore at the Site is situated within the Medium Coastal Inundation Bands.

4.2.3 Shoreline erodibility – 'High-level' (in overview) assessment

The 'Smartline Basic' assessment of the shoreline erodibility is shown in Figure 4. This is a 'High-level' (in overview) assessment only.

Refer also to the Coastal Erosion Hazard Assessment Report (pitt&sherry, 2024).

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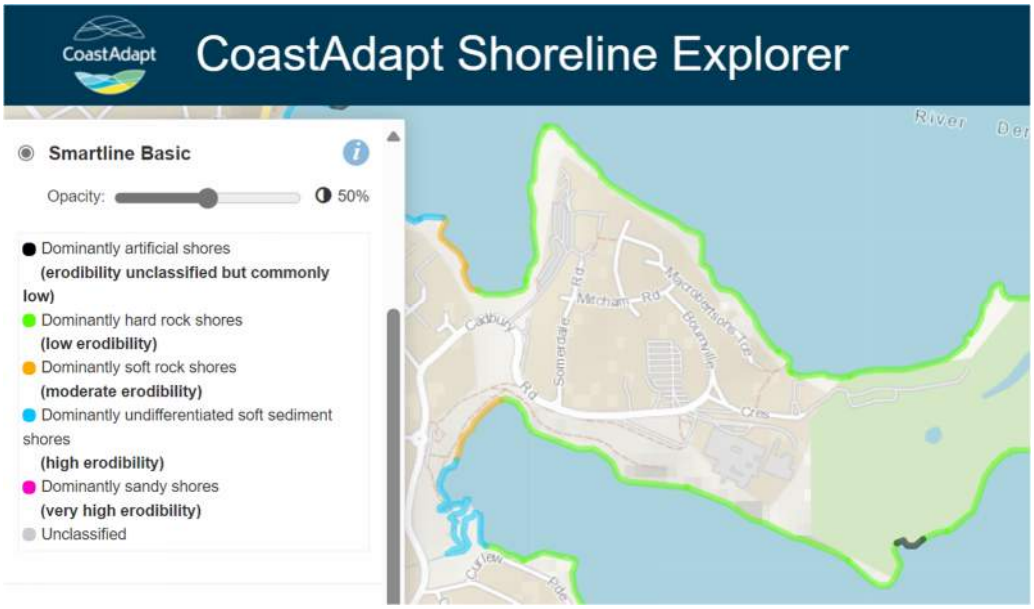


Figure 3: Classification of the shoreline at and near the Site (Source – 'CoastAdapt', 2024)

4.3 Site levels

Levels on the Site shall be derived from the provided survey data. Supplementary information was obtained from 'theLIST' and from the online database 'ELVIS' (Geoscience Australia, 2022) that is publicly available from: Digital Elevation Data | Geoscience Australia (ga.gov.au)

All levels denoted herein are in reference to Australian Height Datum (*AHD83*). Figure 5 shows an image of the contoured elevation levels at the Site.

4.4 Site observations

A visit to Windermere Bay was undertaken on the 16 October 2024 to view the terrain and current form of the beach, generally, at the Site for the proposed development.

Figure 6 is a photo of the shoreline looking eastwards from the Foreshore Reserve, near the Claremont Cenotaph, at the head of Windermere Bay.

Figure 7 is a photo of the subject area for the 'Cadbury Experience' from across Windermere Bay near Curlew Parade.

Figure 8 is a photo of the shoreline scarp beside the existing jetty near to the subject area for the 'Cadbury Experience' that was taken during a separate visit attended by the pitt&sherry Engineering Geologist.

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Figure 4: Aerial photo of the Site showing the 5 m, 10 m and 15 m land contours (Source – 'theLIST', 2025)



Figure 6: Photo of the shoreline along Cadbury Point from the head of Windermere Bay (Source – pitt&sherry, 2024)

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Figure 7: Photo of the shoreline at the subject area on Cadbury Point from across Windermere Bay (Source – pitt&sherry, 2024)



Figure 8: Photo of the shoreline scarp at the existing jetty near the Site on Cadbury Point (Source – pitt&sherry, 2024)

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5. Tides

Tides in the Derwent River near Hobart are of the semi-diurnal mixed type. It is expected that the tide levels in the bay near the subject site will likely be slightly lower than the measurements by the Battery Point tide gauge, however, this is not within the scope of this investigation.

Values of different tide levels, Sea Level Rise (SLR) and the Design High Water (DHW), which is storm tide including storm surge, levels for different years are shown in Table 1. The height of storm surge is the vertical extent to which the still water surface is raised by atmospheric effects including low pressure, winds, etc.

For the purposes of this coastal inundation hazard assessment, the 1% AEP Design High Water level in 2100 is the benchmark for the still water surface level (without wave action effects) and RL 2.35m AHD is adopted. Wind induced setup of the water surface has been calculated for winds of different directions and has been added to this design high water level in modelling.

Table 1: Tide and Design High Water (storm tide) levels for different years and the corresponding projected SLR using IPCC AR6 data

Year	SLR [1]	Tides and Design High Water levels (m, AHD)				Design Life (Years)
		MSL	MHWS	HAT	DHW [1]	
2005	0	0.07 [2]	0.69 [2]	0.88 [2]	1.34	-
2025	0.1	0.17	0.79	0.98	1.44	0
2100	1.01	1.18	1.80	1.99	2.35 [3]	75

[1] Values derived for 1% AEP from the online calculation tool 'Canute 3.0' (CSIRO 2023) for virtual tide gauge #34 based on IPCC AR6 modelling for SSP5-8.5 climate change scenario with 95% confidence limits. The noted sea level rise is assumed to be common to all tide levels for each of the noted years

[2] Levels published by the National Tidal Centre for the Port of Hobart; and

[3] Comparably, a conservative estimate for the Design High Water Level projected for 2100 was reported in a 2008 study by the UNSW Water Research Laboratory, with a value of RL 2.34 m AHD at Wilkinson Point near the site.

6. Waves

An analysis of wind generated waves within the bay adjacent the Site has been undertaken by pitt&sherry. The wave modelling examines the event jointly comprised of 1% AEP wind speeds in 2100, the Design high water level in 2100, and wind setup. Swell waves originating from the southern ocean were considered and determined to not have a meaningful impact on the Site and were not included in the wave modelling.

6.1 Nearshore wave modelling

Wave modelling was undertaken using 'DELFT3D' hydrodynamic software. DELFT3D is a widely used tool that transforms wave spectra from offshore to nearshore based on input tides, bathymetry, wind, swell, currents and obstacles. The model domain and analysis output point beside the subject site are shown in Figure 5.

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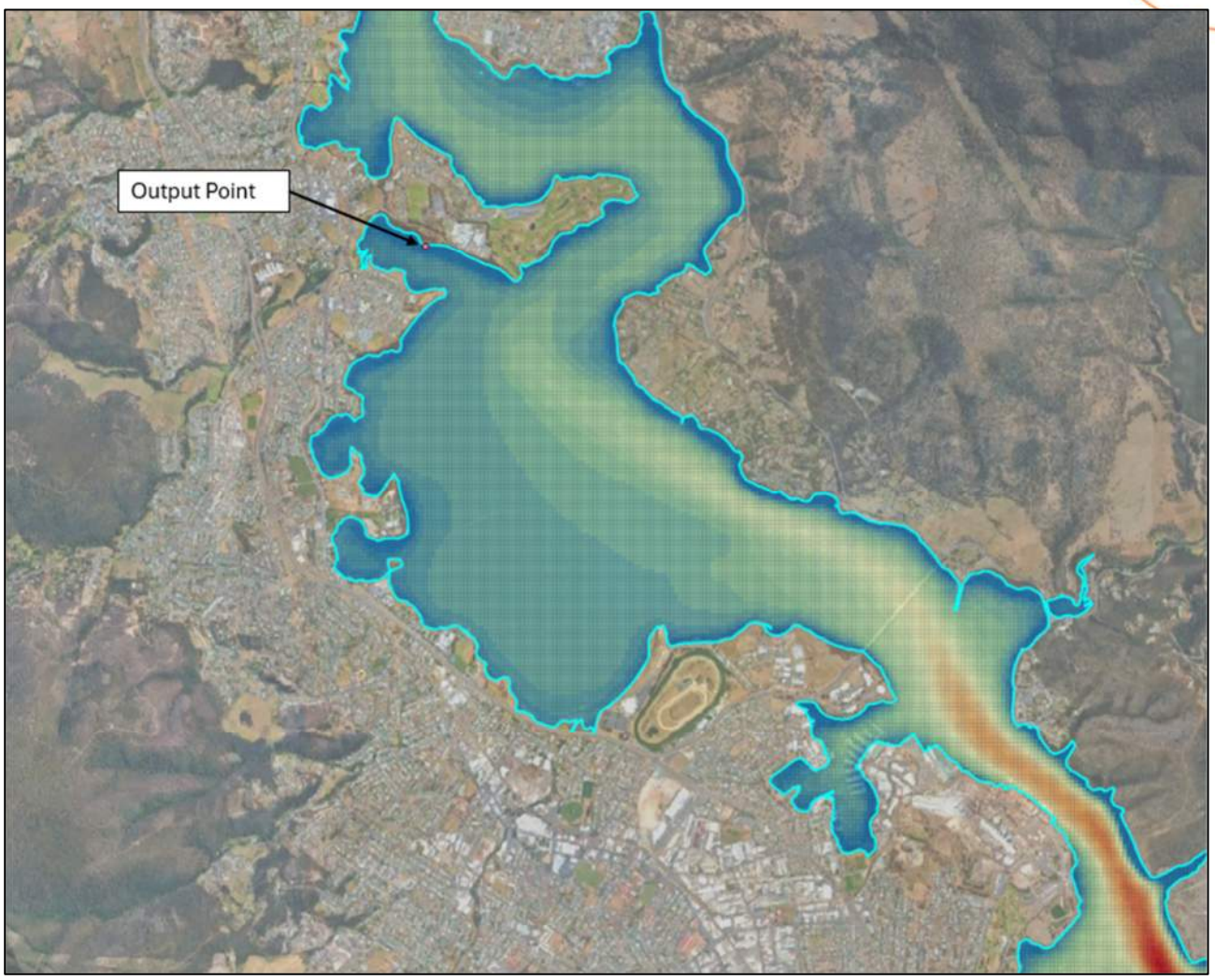


Figure 5: DELFT3D Model domain, showing bathymetry and results output location.

1% AEP design wind speeds were determined following the procedure outlined in *AS/NZS 1170.2:2021*. A further 5% increase was applied to account for projected extreme wind conditions in 2100 for eastern Tasmania under the SSP5-8.5 scenario (CSIRO, 2015). A design tide height of 2.35mAHD has was used in all wave modelling cases to assess worst-case conditions.

The modelling has identified the significant wave heights corresponding to various input conditions at a designated output location within the bay. This location was selected in proximity to the proposed project site, as illustrated in Figure 6. Results from the output point are summarised in Table 2.

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Figure 6: Wave modelling results output point.

Table 2: Significant wave heights (Hs) when the tide is at 2.35 m AHD + wind setup and for the 1% AEP inputs.

Input wind direction (blowing from)	Mean hourly wind speed (m/s)	Combined wind and wave setup (mAHD)	Hs (m)	Tp (s)
Southeast	22.26	2.50	0.694	3.075
South	22.26	2.50	0.631	3.075

Critical wave conditions arise from 1% AEP local southeasterly winds, which generate significant wave heights of approximately 0.694 m at the noted output point (see Figure 7).

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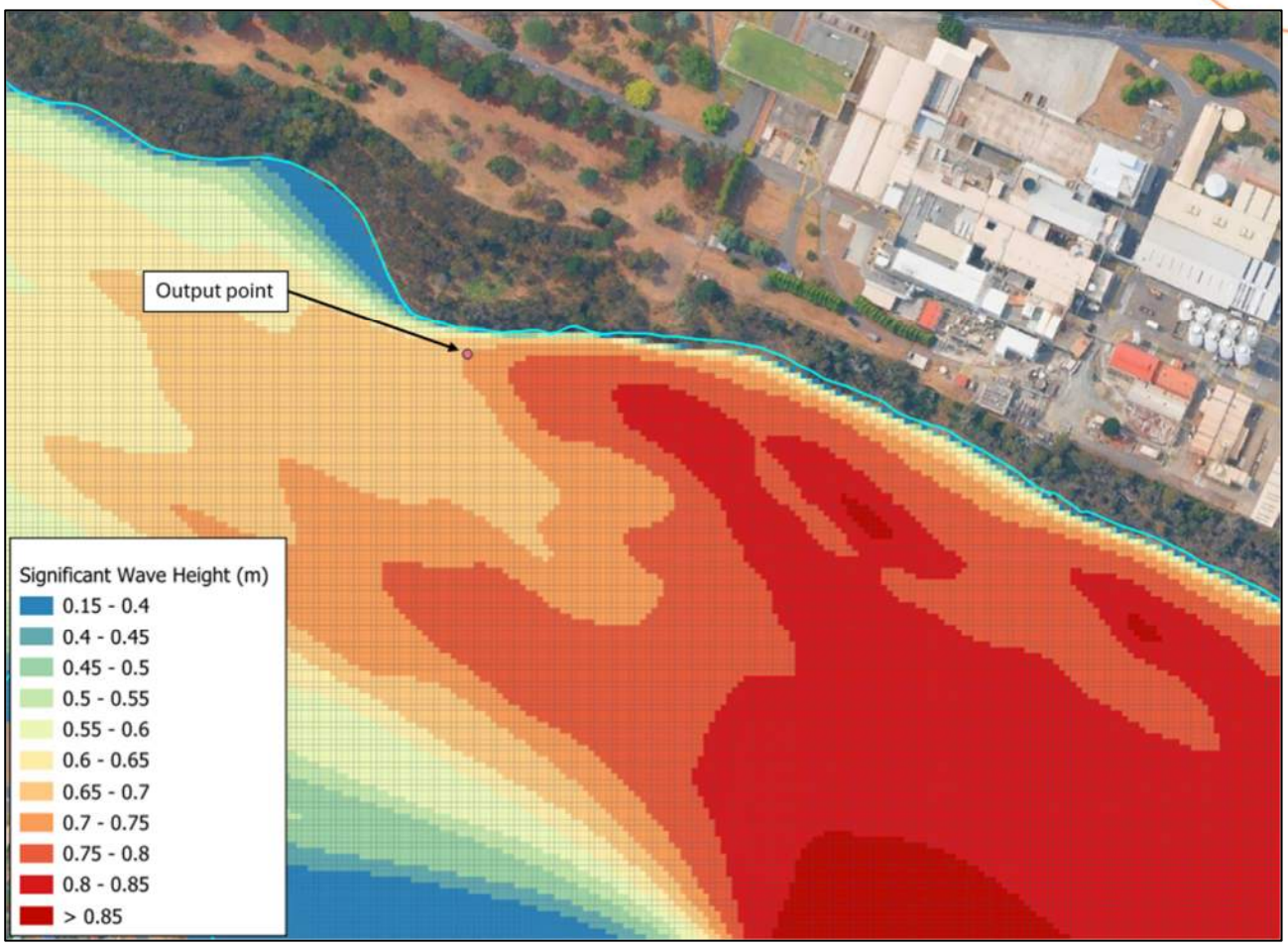


Figure 7: Significant wave heights (Hs) near the Site for the 2100 1% AEP event originating from the Southeast.

6.2 Wave Reflection

Waves propagating to site will undergo specular reflection off the scarp and constructively interfere within the bay. The height of the reflected wave and the extent to which wave heights combine (constructively interfere) depends on the form of the reflecting surface and wave regularity. Reflecting irregular waves create a less noticeable spatial variation of partially standing nodes and antinodes that decrease in magnitude with distance from the scarp compared with regular waves, and generally comprise reduced wave heights.

Regular waves are conservatively assumed for the purposes of this assessment, but a spectrum of irregular waves will develop in reality, leading to more diffuse constructive interference, and lower reflected wave heights. The point seaward of the scarp at which reflected wave energy can be assumed to be negligible was not determined in this assessment.

This assessment has not undertaken a continuous simulation of wave reflection within the bay, which would be necessary to resolve individual wave heights and obtain a high resolution depiction of reflecting behaviour. This analysis could also reveal the extent to which the shoals along Curlew Parade, on the opposite side of the bay, are contributing to reflected wave heights at the proposed site.

A reflected wave height coefficient of 0.85 was calculated using methods in the Coastal Engineering Manual (USACE, 2002), resulting in a total combined wave height of 1.3m.

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7. Opinions about the proposal

Likelihood of the proposed use or development (a dwelling) to cause or contribute to the occurrence of coastal inundation on the site or adjacent land

- Tolerable but unlikely, or nil.

Can the proposed use or development achieve and maintain a tolerable risk for the intended life of the use or development, having regard to the following Q&A matrix?

The nature, intensity and duration of the use	<Does the nature, intensity, and/or duration of the proposed use make it more or less able to achieve and maintain a tolerable risk in relation to coastal inundation?> **Less able, very slightly (if at all)**
The type, form and duration of any development	<Does the type, form, and/or intended duration of the proposed development make it more or less able to achieve and maintain a tolerable risk in relation to coastal inundation?> **Less able, very slightly (if at all)**
The likely change in the risk across the intended life of the use or development	<How is the coastal inundation risk likely to change over time? How will the expected change in risk over time impact the ability of the proposed use or development to achieve and maintain a tolerable risk for the intended life of the use or development?> **The risk of coastal inundation will increase over time due to the projected sea level rise that could occur on the coast at Glenorchy City Council. The expected risk of coastal inundation is managed by designed hazard reduction measures for the buildings and/or works at the Site (minimum height requirements)**
The ability to adapt to a change in the level of risk	<Will the proposed use or development be able to adapt to changes in coastal inundation risks?> **Yes (by suitable design methods)**
The ability to maintain access to utilities and services	<Will the risk of inundation prevent the proposed use or development from being able to maintain access to utilities and services such as water, transport, electricity, or telecommunications infrastructure for the intended life of the use or development?> **Unlikely (by suitable design methods)**
The need for specific coastal inundation hazard reduction or protection measures on the site [2]	<Will specific on-site hazard reduction or protection measures be necessary to enable the proposed use or development to achieve and maintain a tolerable risk for the intended life of the use or development?> **No**
The need for coastal inundation reduction or protection measures beyond the boundary of the site [2]	<Will hazard reduction or protection measures be necessary beyond the boundary of the site to enable the proposed use or development to achieve and maintain a tolerable risk for the intended life of the use or development?> **No**
Any coastal inundation management plan in place for the site or adjacent land [2]	<If there is currently a coastal inundation management plan in place for the site or adjacent land, does it contain/require adequate hazard reduction or protection measures to enable the proposed use or development to achieve and maintain a tolerable risk for the intended life of the use or development?> **I am not aware of any existing coastal inundation management plan that is in place for the site at the time of writing.**

Any advice relating to the ongoing management of the use or development?

- No.

Are there any conclusions relating to any matter specifically required by Performance Criteria from the Coastal

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Inundation Hazard Code (C10.6)?

- No.

8. Tasmanian Planning Scheme – C11 Coastal Inundation Hazard Code requirements

The interpretation of and assessment against the provisions in the Tasmanian Planning Scheme (TPS) relevant to coastal inundation has been undertaken by pitt&sherry and is documented herein.

8.1 C11.1 Code Purpose

This describes that the purpose of the inundation code is to ensure that use or development which may be subject to coastal inundation is appropriately located and managed with acceptable and tolerable risks without increasing risk to other land or infrastructure.

8.2 C11.2 Application of the code

This confirms that the project area is within an inundation hazard area for which the code applies.

8.3 C11.4 Use or development which is exempt from the code.

It is understood from the provisions within TPS section C11.4 that the proposed development at the Site is NOT exempt from the Coastal Inundation Hazard Code because it is:

- Located within a medium coastal inundation hazard band, and
- The proposed development at the foreshore is in a non-urban zone (Environmental Management Zone), based on the applicable definition of non-urban zone under the TPS.

8.4 C11.5 Use standards

8.4.1.1 C11.5.1 Uses within a high coastal inundation hazard band

The proposed development is not located within a high coastal inundation hazard band and this section of the Code is considered NOT APPLICABLE.

8.4.1.2 C11.5.2 Uses located within a non-urban zone and within a medium coastal inundation hazard band

The proposed development is located within a non-urban zone and a medium coastal inundation hazard band, so this section of the Code is considered APPLICABLE.

C11.5.2 Uses located within a non-urban zone and within a medium coastal inundation hazard band	
Objective: To ensure that a use located within a non-urban zone and within a medium coastal inundation hazard band: (a) is reliant on a coastal location; and (b) can achieve and maintain a tolerable risk from exposure to coastal inundation.	
Acceptable Solutions	**Performance Criteria**

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A1 No Acceptable Solution.	P1.1 A use within a non-urban zone and within a medium coastal inundation hazard band must be for a use which relies upon a coastal location to fulfil its purpose, having regard to: (a) the need to access a specific resource in a coastal location; (b) the need to operate a marine farming shore facility; (c) the need to access infrastructure available in a coastal location; (d) the need to service a marine or coastal related activity; (e) provision of an essential utility or marine infrastructure; (f) provision of open space or for marine-related educational, research, or recreational facilities; (g) any advice from a State authority, regulated entity or a council; and (h) the advice obtained in a coastal inundation hazard report. P1.2 A coastal inundation hazard report also demonstrates that: (a) any increase in the level of risk from coastal inundation does not require any specific hazard reduction or protection measures; or (b) the use can achieve and maintain a tolerable risk from a 1% annual exceedance probability coastal inundation event in 2100 for the intended life of the use without requiring any specific hazard reduction or protection measures.

Assessment

A1: No acceptable solution is available, and the proposed development must be assessed against the performance criteria.

P1.1: The proposed development within the medium coastal inundation hazard band is for a jetty for the use of berthing a high-speed catamaran ferry vessel. The development satisfies the performance criteria outlined in P1.1 for the following reasons:

- **P1.1(a) The need to access a specific resource in a coastal location**: The proposed use is not reliant on a specific resource in a coastal location, but remains reliant on the coast to fulfill its purpose as described in responses to other planning provisions below.
- **P1.1(b) The need to operate a marine farming shore facility**: The proposed use does not include any marine farming, but remains reliant on the coast to fulfill its purpose as described in responses to other planning provisions below.
- **P1.1(c) The need to access infrastructure available in a coastal location:** The proposed development, being adjacent the coast, is reliant on the locations visual amenity for attracting tourists, as well as for access to ferry services to meet expected transportation demands.
- **P1.1(d) The need to service a marine or coastal related activity:** The proposed development, being adjacent the coast, is reliant on the locations visual amenity for attracting tourists, as well as for access to ferry services to meet expected transportation demands.
- **P1.1(e) Provision of an essential utility or marine infrastructure:** The proposed development is not considered to provide essential utility or marine infrastructure, but is nonetheless reliant on its coastal location to full its purpose for the reasons given in responses to other TPS C11.5.2 criteria
- **P1.1(f) Provision of open space or for marine-related educational, research, or recreational facilities:** The proposed development does not provide open space for marine related education or research, or

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recreational facilities, but is nonetheless reliant on its coastal location to full its purpose for the reasons given in responses to other TPS C11.5.2 criteria

- **P1.1(g) Any advice from a State authority, regulated entity or a council:** pitt&sherry is not aware of any specific advice from a state authority, regulated entity or council at the time of writing
- **P1.1(h) The advice obtained in a coastal inundation hazard report:** The advice in this coastal inundation hazard report supports that the proposed development is for a use which relies upon a coastal location to fulfil its purpose, and may achieve a tolerable risk from inundation provided certain measures are taken.

P1.2: The advice in this coastal inundation hazard report, particularly sections 7 and 10, demonstrates that:

- **P1.2(a)** Any increase in the level of risk from coastal inundation DOES NOT require any specific hazard reduction or protection measures; and
- **P1.2(b)** The proposed use CAN achieve and maintain a tolerable risk from a 1% annual exceedance probability coastal inundation event in 2100 for the intended life of the use WITHOUT requiring any specific hazard reduction or protection measures.

Therefore, provided the recommendations outlined in this report are accounted for during the design process, the proposed development is considered to meet the performance criteria of C11.5.2.

8.4.1.3 C11.5.3 Uses located within a non-urban zone and within a low coastal inundation hazard band

The proposed development is not located within a low coastal inundation hazard band and this section of the Code is considered NOT APPLICABLE.

C11.5.4 Critical use, hazardous use or vulnerable use

The proposed development is not a critical, hazardous, or vulnerable use and this section of the Code is considered NOT APPLICABLE.

8.5 C11.6 Development Standards for Buildings and Works

8.5.1 C11.6.1 Buildings and works, excluding coastal protection works, within a coastal inundation hazard area

The proposed development is located within a coastal inundation hazard area, so this section of the Code is considered APPLICABLE.

C11.6.1 Buildings and works, excluding coastal protection works, within a coastal inundation hazard area	
Objective: That: (a) building and works, excluding coastal protection works, within a coastal inundation hazard area, can achieve and maintain a tolerable risk from coastal inundation; and (b) buildings and works do not increase the risk from coastal inundation to adjacent land and public infrastructure.	
Acceptable Solutions	**Performance Criteria**
A1 No Acceptable Solution.	P1.1 Buildings and works, excluding coastal protection works, within a coastal inundation hazard area must have a tolerable risk, having regard to: (a) whether any increase in the level of risk from coastal

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	inundation requires any specific hazard reduction or protection measures; (b) any advice from a State authority, regulated entity or a council; and (c) the advice contained in a coastal inundation hazard report. P1.2 A coastal inundation hazard report also demonstrates that the building or works: (a) do not cause or contribute to coastal inundation on the site, on adjacent land or public infrastructure; and (b) can achieve and maintain a tolerable risk from a 1% annual exceedance probability coastal inundation event in 2100 for the intended life of the use without requiring any specific coastal inundation protection works.

Assessment

A1: No acceptable solution is available, and the proposed development must be assessed against the performance criteria.

P1.1: The advice in this coastal inundation hazard report, particularly sections 7 and 10, demonstrate that:

- **P1.1(a)** Any increase in the level of risk from coastal inundation DOES NOT require any specific hazard reduction or protection measures
- **P1.1(b) Any advice from a State authority, regulated entity or a council:** pitt&sherry is not aware of any specific advice from a state authority, regulated entity or council at the time of writing
- **P1.1(c) The advice obtained in a coastal inundation hazard report:** The advice in this coastal inundation hazard report supports that the proposed development CAN achieve and maintain a tolerable risk from coastal inundation.

P1.2: The advice in this coastal inundation hazard report, particularly sections 7 and 10, demonstrates that the proposed development:

- **P1.2(a)** DOES NOT cause or contribute to coastal inundation on the site, on adjacent land or public infrastructure; and
- **P1.2(b)** CAN achieve and maintain a tolerable risk from a 1% annual exceedance probability coastal inundation event in 2100 for the intended life of the use WITHOUT requiring any specific coastal inundation protection works.

Therefore, provided the recommendations outlined in this report are accounted for during the design process, the proposed development is considered to meet the performance criteria of C11.6.1.

8.5.2 C11.6.2 Coastal protection works within a coastal inundation hazard area

The proposed development does not include coastal protection works and this section of the Code is considered NOT APPLICABLE.

8.6 C11.7 Development Standards for Subdivision

The proposed development does not require the subdivision of land, and this section of the Code is considered NOT APPLICABLE.

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9. Conclusions

The proposed development is situated within a medium coastal inundation hazard band and a non-urban zone according to the TPS. Accordingly, the proposed development is not exempt, and the Coastal Inundation Hazard Code has been addressed in Section 8.

No detailed drawings for proposed buildings/works at the Site have been provided to pitt&sherry. Nevertheless, providing that all buildings and/or works at the Site are designed and constructed well clear of the foreshore scarp at an appropriate height above the water then I believe it is possible to achieve and maintain avoidance of risk from coastal inundation or at the least be a tolerable risk for the expected life of the development through to 2100.

The Glenorchy City Council Local Provisions Schedule, GLE-Table C11.1 Coastal Inundation Hazard Bands AHD Levels requires that developments in the municipality are elevated above at least 2.6 m AHD.

Therefore, the minimum soffit level of the jetty and connecting coastal structures should = 2.6 m AHD + 1.3 m allowance for wave action effects, say = 3.9 m AHD (provisional level). If this level is adopted, then the information presented in the preceding section of this report demonstrates that either a zero or negligible risk is likely during the future use of and development at the Site.

10. Discussion

To accommodate a fixed jetty height of 3.9 m AHD, the end span (gangway) of the jetty will require hydraulic jacking to provide vertical translation for berthing vessels. A minimum vertical translation equal to the range of extreme astronomical tides in Hobart should be adopted, which is HAT(0.941mAHD) - LAT(-0.744mAHD) = 1.685m. This would allow ferry personnel to disembark in such a way that the maximum allowable longitudinal grade required by the Disability Discrimination Act (1V:14H) for pathways is not exceeded, assuming a gangway length of 15m is adopted.

However, assuming a typical berthing ferry deck height at approximately 2m above sea level, then a gangway hinge set at a future design tide + wave height of 3.9mAHD would require a large vertical translation range, long gangway, or both, to service the present-day tidal range, which is not expected to be feasible for construction. A present-day jetty soffit elevation of approximately 2.1 m AHD would accommodate the range of typical astronomical tides assuming a 1.7m vertical range is provided, however:

- This would expose the coastal structure to significant wave loads and frequent inundation
- Tides are influenced by atmospheric effects such as low-pressure systems and wind setup. In inclement conditions, it is possible that DDA-compliant disembarkation will not be achieved if this occurs coincidentally with extreme astronomical tides. Additionally, disembarkation may become unsafe for less mobile passengers
- Under the influence of sea level rise, the jetty may be subject to prolonged inundation, increased wave loads, and eventually will limit DDA-compliant disembarkation during higher tides. Additionally, disembarkation may become unsafe for less mobile passengers as large step-downs form between the ferry deck height and gangway

To control these risks, it is recommended that the jetty soffit be elevated above a minimum of 2.6 m AHD, and that additional consideration is given to:

- The preferred range of serviceable tides (1.685m astronomical, plus an allowance for wind setup and low-pressure systems)
- Allowance for sea level rise
- Equipping vessels with an additional, detachable aluminium (or similar) gangway to increase the range of serviceable conditions
- Inputs from vessel operators
- The seaward extremity of reflected wave heights, which should be investigated during detailed design.

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Coastal Inundation Hazard Assessment Report

‘Cadbury Experience Project’ – Windermere Bay, Claremont

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pitt&sherry



Environmental Site Assessment

Cadbury Visitor Experience Centre
100 Cadbury Road, Claremont
Tasmania 7011

Prepared for

Chocolate Experience No. 2 *(a trading company established by Simon Currant and Associates and partner investors*)

Client representative

Michelle Mhemba

Date

29 August 2025

Rev00

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Revision History					
Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
A	Draft for internal review	EPM	FKP	FKP	19/08/2025
B	Final draft to client	EPM	FKP	FKP	26/08/2025
00	Final issue with client feedback	EPM	FKP	FKP	29/08/2025

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Executive Summary

Background

Chocolate Experience No. 2 (a trading company established by Simon Currant and Associates and partner investors) in partnership with Mondelez Australia Pty Ltd is proposing to develop a visitor experience centre (the Project) adjacent to the existing Cadbury's Chocolate Factory at 100 Cadbury Road, Claremont, Tasmania 7011 (the Property). The Project footprint is defined as the 'Site' for the purposes of this report. Given the Property is regulated by the Environmental Protection Authority (EPA), and given potentially contaminating activities may have occurred within the Site footprint, an Environmental Site Assessment (ESA) prepared by a suitably qualified and experienced person in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999* amended 2013 (ASC NEPM) is required as a component of the Development Application to enable Glenorchy City Council to assess the Site's suitability for the proposed future use and development against the relevant provisions of the Potentially Contaminated Land Code (PCLC) of the Tasmanian Planning Scheme.

Pitt & Sherry (Operations) Pty Ltd (pitt&sherry) has been engaged to complete the ESA for the Site. The ESA has been divided into two stages, with the first stage, a Site History Review, completed and issued by pitt&sherry in February 2025. At the completion of the SHR, it was determined that identified potential contamination risks needed to be assessed by intrusive investigations under a second stage of works. This report documents the works completed under the second stage of the contaminated land investigations. The report integrates of the results of both stages, as well as the final risk assessment for the Site, constituting the ESA designed to address the regulatory requirements under the PCLC for the Project.

Conclusions

Based on the findings of this ESA and noting the Limitations (Section 1.5) and identified data gaps (Section 8.1):

- Fill material has been confirmed to be present throughout the Site and also adjacent to the Site within the landfill area that was formed into a levelled terrace south of the Site, and to the west, along the walkway within the historic railway alignment. The fill material consists mostly of mixed sand and gravel with some reworked natural soils, and extends to varying depths across the Site. Building demolition rubble (BDR) and sundry wastes were occasionally present. Furthermore, only synthetic mineral fibres (SMF) have been positively identified within some samples, with no asbestos fibres detected. While BDR was not often present within the fill layers, two parallel concrete structures were observed southwest of the Site, and concrete rubble was often seen at surface, suggesting buried infrastructure could still be present in some locations, which would pose aesthetic and structural risks for the Project
- Screening assessment completed in the shallow layers of the soil profile indicates that no significant impact has occurred from particulate fallout from the Cadbury factory, given no detectable concentrations of dioxins and furans were reported, and nitrogen oxides concentrations were reported within the expected range for natural soils. Sulfur oxides concentrations above the expected range for natural soils is likely related to the origin of the fill material onsite
- While the finding of ballast within location CABH02 suggests that residual materials may still be present within the former railway alignment, reported contaminant concentrations in soils and the leachability testing in the ballast sample suggest that it is unlikely that residual impacts from the historic railway would be present at unacceptable levels within the Site or at the proposed start of the new access tracks to the proposed jetty
- The **preliminary**, insitu, waste classification suggests that the materials onsite would be predominantly classified as *Level 1 – fill material* in accordance with Tasmania EPA *Information Bulletin no. 105* (IB105), except for the southern portion of the Site where *Level 2 – low-level contaminated soils* were found to occur in certain layers of the fill profile. Furthermore, the terraced landfill area to the south of the Site and shallow layers of the profile along the walking track leading to the Site, are also classified indicatively as *Level 2 – low-level contaminated soils*. Figure 3 within Appendix A shows the indicative boundary of the preliminary waste classification completed, and waste soils management measures are recommended in Section 9.2 (and replicated below)

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- Soils and fill material from the investigation areas are considered suitable for onsite reuse from both human health and ecological perspectives provided the recommendations for waste management in Section 9.2 (and replicated below) are implemented, especially around the limitations for reuse of materials from areas with level 2 waste and areas where exceedances of the ecological criteria were reported; and
- Overall, no unacceptable level of risk to any receptors was identified from on- and off-site sources of potential contamination as the source-pathway-receptor linkages were either incomplete or low risk.

NOTE: An updated project footprint was issued upon completion of the ESA investigations. The figures within Appendix A show the Site investigation area in red line, while the updated footprint, provided on 28/8/2025, is shown in blue dotted line. The updated footprint extends outside of the Site investigation for this ESA, however the contamination risk in areas to the north and east, beyond the Site investigation boundary, and within the blue dotted line, is deemed to be similar to the areas investigated via test pitting in the north of the Site and via trenching in the south-east of the Site. As such, the recommendations made initially for the investigated Site area, apply just as well to the extended footprint, shown in blue dotted line.

Suitability statement – potentially contaminated land code

This ESA demonstrates that the Site is suitable for the proposed use and development with regards to the PCLC of the Planning Scheme given: no unacceptable level of risk has been identified; and the recommendations in Section 9.2 (and replicated below) satisfy the performance criteria P1(c) of the development standards C14.6.1 of the PCLC.

Recommendations

Based on the findings of this ESA, the following recommendations are made:

- A **Construction Environmental Management Plan** will need to be developed for the construction stage of the Project and should include (and not be limited to) the following:
  - Effective dust control measures to limit exposure of workers to synthetic mineral fibres potentially present within the Site soils and/or fill materials
  - Effective soil containment and erosion management and prevention, due to the nearby Derwent Estuary
  - Measures for dealing with unexpected potentially contaminated finds, and potentially buried infrastructure/features given the observations of concrete rubble at surface and two parallel concrete features southwest of the Site. These measures may need to include the removal of these concrete members to remove any aesthetic concern, and measures for dealing with any contamination potentially associated with them, which may include the engagement of a site contamination specialist
  - Waste management measures for **onsite reuse** of excavated materials:
    - Do not reuse soils with stains or odours
    - Complete separation and segregation of solid wastes, including building demolition rubble, from soils prior to onsite reuse to prevent aesthetic risks
    - Soils and fill from areas where level 2 wastes and/or exceedances of ecological criteria were reported (refer Figure 3 within Appendix A) should be reused either within the building footprint or covered with paving, or topsoils if reused in planted areas
  - Waste management measures for **offsite disposal** of excavated materials:
    - Where practicable, segregation of the excavated materials/soils should be carried out based on the results of the preliminary waste classification in this ESA (refer Figure 3 within Appendix A) to minimise the costs associated with waste disposal
    - Sampling and analysis of excavated waste soils for waste classification in accordance with IB105 to be completed prior to offsite disposal; and
- Offsite disposal of any excavated material/soil classified as Level 2 or above (under IB105) requires pre-approval from the EPA under a Regulation 21 application.

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Abbreviations

Abbreviation	Description
ACM	Asbestos-containing material(s)
AHD	Australian Height Datum
ALS	Australian Laboratory Services
AS 4482.1	AS 4482.1 *Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds*, Standards Australia, 2 November 2005 or as amended or substituted
AS 4482.2	AS 4482.2 *Guide to the sampling and investigation of potentially contaminated soil – Volatile substances, Standards Australia*, 5 September 1999 or as amended or substituted
ASC NEPM	*National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013*
ASS	Acid sulfate soils
B(a)P	Benzo(alpha)pyrene
BOM	Bureau of Meteorology
BDR	Building demolition rubble
BTEXN	Benzene, toluene, ethylbenzene, xylenes and naphthalene
CEMP	Construction Environmental Management Plan
CEnvP SC	Certified Environmental Practitioner Site Contamination specialist
CFEV	Conservation of freshwater ecosystem values program
CoA	Certificates of analysis
CoC	Chain of custody
CoPC(s)	Contaminant(s) of potential concern
Council	Glenorchy City Council
Cr / Cr(III) / Cr(VI)	Chromium (total) / trivalent chromium / hexavalent chromium
CRC Care Technical Report No. 10	CRC Care *Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater*, September 2011, including errata August 2012
CSM	Conceptual site model
DQO(s)	Data quality objective(s)
EIANZ	Environmental Institute of Australia and New Zealand
EIL(s) / ESL(s)	Ecological Investigation Level(s) / Ecological Screening Level(s)
EMPC Act	*Environmental Management and Pollution Control Act 1994* (Tasmania)
EPA	Environment Protection Authority, Tasmania
ESA	Environmental Site Assessment
FCR	Fine crushed rock
GIAP	Groundwater Information Access Portal
GDE	Groundwater dependent ecosystem(s)
ha	Hectares
HIL(s) / HSL(s)	Health Investigation Level(s) / Health Screening Level(s)
IB105	*Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal, Version* 3, Environment Protection Authority Tasmania, 2018
IMW(s)	Intrusive maintenance worker(s) (i.e. construction workers)

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Abbreviation	Description
LUPAA	The *Land Use and Planning Approvals Act 1993*
LISTmap	Land Information System Tasmania interactive web mapping tool
LOR(s)	(Laboratory) Limit(s) of reporting
mbgl	Metre(s) below ground level
NATA	National Association of Testing Authorities
NE	No exceedance(s)
NOA	Naturally occurring asbestos
NOx	Nitrogen oxides
NPI	National pollutant inventory
PAH	Polycyclic aromatic hydrocarbons
PCA(s)	Potentially contaminating activity(ies)
PCLC	Potentially Contaminated Land Code (of the Tasmanian Planning Scheme)
PID	Photoionisation detector
pitt&sherry	Pitt & Sherry (Operations) Pty Ltd
Planning Scheme	Tasmanian Planning Scheme - Glenorchy
Property	100 Cadbury Road, Claremont, Tasmania 7011
QA/QC	Quality assurance / quality control
RPD(s)	Relative percentage difference(s)
SAQP	Sampling, Analysis and Quality Plan
SHR	Site history review - pitt&sherry, 2025. *Site History Review - Cadbury Visitor Experience Centre, 100 Cadbury Road, Claremont, Tasmania 7011*. February, 2025.
Site	Proposed Visitor Experience Centre Project footprint adjacent to the existing Cadbury's Chocolate Factory at 100 Cadbury Road, Claremont, Tasmania 7011 (see Figure 1, Appendix A)
SMF	Synthetic mineral fibres
SOx	Sulfur oxides
SPR	Source-pathway-receptor
SRN	Sample receipt notification
Tbs	Tholeiite basalt
TCLP	Toxicity Characteristic Leaching Procedure
THR	Tasmanian Heritage Register
TPH / TRH	Total petroleum hydrocarbons / total recoverable hydrocarbons
TQ	Undifferentiated Cenozoic sediments
TQds	Poorly-consolidated to unconsolidated sand, clayey labile sand, silt and subordinate clay and fine-grained gravel
TQv	Supra-basalt moderately lithified conglomerate
UCL(s)	Upper confidence limit(s)
UPSS	Underground petroleum storage systems
VOCs	Volatile organic compounds
Waste Regulations	*Environmental Management and Pollution Control (Waste Management) Regulations 2020*

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1. Introduction

1.1 Background

Chocolate Experience No. 2 (a trading company established by Simon Currant and Associates and partner investors is proposing to develop a visitor experience centre (the Project) adjacent to the existing Cadbury's Chocolate Factory at 100 Cadbury Road, Claremont, Tasmania 7011 (the Property). The Project footprint is identified as the 'Site' in this report[1]. SCA has formed a partnership with the Property owner, Mondelez Australia Pty Ltd, who have granted a 50-year lease over the Property parkland, including access to the Property's waterfront.

Given the Property is regulated by the Environmental Protection Authority, Tasmania (EPA) and the former storage of fuel in underground petroleum storage systems (UPSS) at the Property (i.e. potentially contaminating activity (PCA)), and given the potential for contaminating activities to have occurred within the Site footprint, an Environmental Site Assessment (ESA) is required as a component of the Development Application for the Project. The ESA will enable Glenorchy City Council (Council) to assess the Site's suitability for the proposed future use and development (i.e. visitor experience centre) against the relevant provisions of the Potentially Contaminated Land Code (PCLC) of the Tasmanian Planning Scheme (the Planning Scheme). The ESA was prepared by a suitably qualified and experienced person in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999* amended 2013 (ASC NEPM).

Pitt & Sherry (Operations) Pty Ltd (pitt&sherry) has been engaged by Chocolate Experience No. 2 to complete the ESA for the Site. The ESA has been divided into two stages. The first stage, a Site History Review (SHR), was completed and issued by pitt&sherry in February 2025 (pitt&sherry, 2025). The SHR compiled and assessed historical information relating to the Site and Property to determine whether there was potential for the Site to be contaminated as a result of identified PCAs, and whether they may present an unacceptable risk to human health and/or ecological receptors. At the completion of the SHR, it was determined that potential contamination risks needed to be assessed by intrusive investigations under a second stage of works. This report documents the works completed under the second stage of the contaminated land investigations. The report integrates the results of both stages, as well as the final risk assessment for the Site, constituting the ESA designed to address the PCLC requirements.

1.2 Objectives

1.2.1 Environmental site assessment

The ESA has been prepared in accordance with the framework of ASC NEPM, and under the guidance of a Certified Environmental Practitioner Site Contamination specialist (CEnvP SC), accredited under the Environmental Institute of Australia and New Zealand (EIANZ).

The general objectives of the ESA are to identify:

- The potential for contamination to be present within the Site as a result of identified PCAs
- The risks posed by any potential, or identified contamination to human health and/or the environment from the Site during the proposed use and associated excavation works
- Whether any additional intrusive investigations (e.g. sampling) are required to confirm (or otherwise) the presence of contamination within the Site; and
- Whether any ongoing management or remediation works are required to demonstrate the suitability of the Site for the intended land use.

[1] Please note that on 28/8/2025, pitt&sherry was provided with an updated project design, after completion of the ESA. The updated footprint differs from the investigated Site area, to the north and east, as shown in the figures within Appendix A. The contamination risk in the extra areas to the north and east is similar to the investigated areas and this ESA is deemed to be sufficient to assess those risks. We have identified residual risks (which are equivalent in the investigated Site and the extended footprint), and are to be managed via a Construction Environmental Management Plan (CEMP), as detailed in Section 9.2.

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1.2.2 Potentially contaminated land code

The objective of the PCLC is to ensure that use or development of potentially contaminated land does not adversely impact on human health or the environment.

The performance criteria (P1) under Clause 14.6.1 Development Standards for Building Works – Excavation works, excluding land subject to the *Macquarie Point Development Corporation Act 2012* of the PCLC states that:

> *Excavation, excluding on land subject to the Macquarie Point Development Corporation Act 2012, must not have an adverse impact on human health or the environment, having regard to:*
>
> *(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated;*
>
> *(b) an environmental site assessment that demonstrates that the level of contamination does not present a risk to human health or the environment; or*
>
> *(c) an environmental site assessment, including a plan to manage contamination and associated risk to human health and the environment, that includes:*
>
> *(i) any specific remediation and protection measures required to be implemented before excavation commences; and*
>
> *(ii) a statement that the excavation does not adversely impact on human health or the environment.*

It is worth noting that the proposed commercial/industrial use at the Site does not qualify as a sensitive use or a specified use listed in Table C14.1, and therefore the use standards of the PCLC are not applicable.

This ESA aims to satisfy the applicable performance criteria under the Development Standards of the PCLC under the Planning Scheme by providing:

- A statement that the level of contamination does not pose a risk to human health or the environment; and that, if necessary; and
- A plan to manage residual risks of contamination should be developed and implemented to minimise the residual risks to human health and the environment.

1.3 Scope of works

The pitt&sherry scope of work comprised:

- Summarise the site history and findings in relation to potential contamination onsite from the SHR (pitt&sherry, 2025) – Section 3
- Compile the preliminary conceptual site model (CSM) for the Site – Section 4
- Design and implementation of a sampling, analysis and quality plan (SAQP) – Section 5 to Section 7
- Assessing the potential for the Site to be contaminated and the human health and ecological risks posed by any potential or identified contamination; and determining whether any additional intrusive investigations and/or management measures are required for the proposed use and development – Section 8 and Section 9; and
- Compiling the findings into an ESA report (this report).

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1.4 Legislation and guidelines

This ESA was undertaken in general accordance with the following legislation and guidelines (as applicable):

- AS 4482.1 *Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds*, Standards Australia, 2 November 2005 or as amended or substituted (AS 4482.1)
- AS 4482.2 *Guide to the sampling and investigation of potentially contaminated soil – Volatile substances, Standards Australia*, 5 September 1999 or as amended or substituted (AS 4482.2)
- ASC NEPM
- CRC Care *Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater*, September 2011, including errata August 2012 (CRC Care Technical Report No. 10)
- *Environmental Management and Pollution Control Act 1994* (EMPC Act) (Tasmania) and relevant Regulations
- *Environmental Management and Pollution Control (Waste Management) Regulations 2020* (Waste Regulations)
- Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal, Version 3, Environment Protection Authority, Tasmania, 2018 (IB105); and
- The Planning Scheme.

1.5 Limitations

Limitations of this ESA include:

- Intrusive investigations were limited to the Site, landfill area immediately to the south (part of investigation location CATR01 only) and the indicative location of the proposed pathway connections from the proposed new jetty to the existing walking track to the west of the Site
- Given the coarse nature of the ballast and no availability for crushing into smaller pieces, the standard laboratory leaching procedures could not be applied and therefore the ballast analysis could not be issued under the NATA certification; and
- Other than the investigated pathway locations mentioned above, no other investigations have been conducted into the proposed jetty arrangements for the proposed visitor experience development.

In addition to the above, the identified remaining data gaps (Section 8.1) should be noted, and the standard report limitations listed at the end of this report, titled *Important information about your report,* should also be considered.

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2. Property and site setting

2.1 Property and site identification

Property and Site identification details are provided in Table 1.

The Property is divided into three discontinuous areas that are registered under the same Property identification and title. The main area, comprising the Cadbury factory and the proposed Site, is located to the south and separated from the two other minor areas by Cadbury Road and Bournville Crescent. These two minor areas of the Property consist of the parking lot and a small, grassed area in the middle of the intersection of Cadbury Road and Bournville Crescent. The Property and Site areas are shown on Figure 1 (Appendix A).

The specific sources of information for the Site setting, including the initial Site inspection completed by pitt&sherry and specialist database reports, have been obtained and presented in the SHR (pitt&sherry, 2025).

Table 1: Property and Site details

Item	Detail	Information Source
Address	• 100 Cadbury Road, Claremont, Tasmania 7011.	LISTmap[2] – Cadastral parcels layer
Property identification and title	• Property ID 2245343; and • Property CT 139355/2. The Site is completely within the Property boundary.	LISTmap – Cadastral parcels layer Figure 1 (Appendix A)
Property and Site areas	• Property – approximately 17.6 hectares (ha) comprising the three discontinuous areas; and • Site – approximately 0.6 ha.	LISTmap – Cadastral parcels layer Figure 1 (Appendix A)
Zoning	Under the Planning Scheme, the • Property – is zoned a combination of: o 'General Industrial' – bulk of the Property, including the eastern half of the parkland o 'Environmental Management' – along the foreshore o 'Light Industrial' – portion of the Property consisting of the parking lot, separated from the Cadbury factory area by Cadbury Road o 'Open Space' – western half of the parkland and a small portion of land to the north-west of the factory, south of the Cadbury Road and Bournville Crescent intersection • Surrounding areas are zoned a combination of: o North – 'General Residential', 'Open Space' and 'Recreation' o East – 'Recreation' and 'Environmental Management' o South – Windemere Bay (waterbody); and o West – 'Open Space' and 'Environmental Management'.	LISTmap – Tasmanian planning scheme zones layer SHR (pitt&sherry, 2025)

[2] Land Information Systems Tasmania interactive mapping tool (LISTmap). Tasmanian Planning Scheme zones layer.

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Item	Detail	Information Source
Planning Scheme Code overlays	Under the Planning Scheme, code overlays for the Property comprise: • Local Historical Heritage Code (whole Property) • Flood-prone Hazard Areas Code (in some isolated areas near the centre-north of the Property, around the existing Cadbury Chocolate Factory and parking lot and including the Site) • Coastal Erosion Hazard Code (along the foreshore to the east of the Property) • Natural Assets Code - Waterway and coastal protection area (along the foreshore) • Natural Assets Code - Priority vegetation area (at the foreshore within the centre portion of the Property) • Natural Assets Code - Future coastal refugia area (discontinuous along the foreshore of the Property) • Landslip Hazard Code (along the foreshore from the centre to the east of the Property plus a small area at the foreshore to the west); and • Coastal Inundation Hazard Code (discontinuous along the foreshore of the Property).	LISTmap – Tasmanian planning scheme code overlay layer SHR (pitt&sherry, 2025)
Regional setting	Property: • Located in Claremont on a peninsula surrounded by the Derwent River and linked to land on the western side. Claremont Golf Course, the Cadbury Oval and some residential areas are also present in this area • Vehicle access is exclusively via Cadbury Road. A bike track also extends from Intercity Cycleway at Claremont to the Cadbury peninsula and into the Property in a section near the foreshore. A short foreshore walking track is present parallel to the bike track within the Property; and • The Cadbury factory occupies most of the central and eastern portion of the Property, with the remaining areas to the west (including the Site) comprising parkland, with a combination of minor access roads/tracks and open areas with isolated spaced trees (landscaping), which become denser and more varied along the foreshore. Current neighbouring uses include: • The Property is bounded south by Windermere Bay, part of the Derwent River • The Claremont Golf Course is located immediately to the east (‘Recreation’ zone) • Cadbury Oval (‘Recreation’ zone) and residential areas (‘Residential’ zone) are present to the north-west and north; and • The Property limit to the west is at the entrance of the peninsula, with the bike track and open areas along the foreshore immediately at the boundary (‘Open Space’ and ‘Environmental Management’ zones).	LISTmap – State aerial basemap and Tasmanian planning scheme zones layer SHR (pitt&sherry, 2025)

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Item	Detail	Information Source
Sensitive receptors	Sensitive receptors within and in the vicinity of the Property comprise: • Property users, including recreational uses (expected to be minimal apart from users of the bike and foreshore walking tracks that cross the Site) • Onsite fauna and flora, especially within the foreshore area • Foreshore reserve to the west • Residential areas to the north • Claremont golf club to the east and Cadbury oval and Claremont Bowls and Community Club to the north (sports and recreation); and • Aquatic ecosystem of the Derwent River to the south.	LISTmap – Hydrology all layer and basemaps SHR (pitt&sherry, 2025)
Current landowner	• Mondelez Australia Pty Ltd.	Client
Current land use	• The Property is currently used by the Cadbury Chocolate Factory, which occupies most of the central and eastern portion of the land; and • The parkland area to the west, including the Site, comprises a combination of minor access roads/tracks and open areas with isolated spaced trees (landscaping), which become denser and more varied along the foreshore.	LISTmap State aerial imagery
Local Government	• Glenorchy City Council (Council).	LISTmap – Local government areas overlay
Land tenure	• Private freehold.	LISTmap – Land tenure layer

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2.2 Property and Site description

Available information on Property and Site features is summarised in Table 2.

Table 2: Property and Site description

Feature	Detail	Information source
Infrastructure features	• The Property is serviced by power, water, stormwater, gas, sewer and telecommunications; majority of services are reticulated underground; and • A historically railway alignment connecting the Cadbury peninsula to the railway network at the mainland was present at the Property in the past, but has since been removed. The railway alignment ran through the southern portion of the peninsula, crossing the Property and the Site until it reached the Cadbury factory.	LISTmap – Utilities and communications layers and water and sewer layers SHR (pitt&sherry, 2025)
Easements	No easements are mapped within the Property. Note that title information has not been reviewed.	LISTmap –Easements layer
Topography	• The Property is located between 0 and 20 m Australian Height Datum (AHD) • Most of the Property, including the centre north area that comprises all the Cadbury Chocolate Factory (and the Site), is predominantly flat and sits at around the 15 mAHD elevation mark; and • The southern boundary and extreme western areas of the Property comprise a steep embankment/cliff on the south side, towards the Windermere Bay, with elevations ranging from 0 to 15 mAHD.	LISTmap – 5m contour layer SHR (pitt&sherry, 2025)
Surface water	• The Property is within the CFEV3 Derwent Estuary-Bruny catchment • Windermere Bay, part of the Derwent River, is located adjacent to the southern boundary of the Property • Windermere Bay and the whole extent of the Derwent River adjacent to the Property location is a CFEV estuary of very-high integrated conservation value; and • No other rivers or waterbodies are present at or near the Property.	LISTmap – Hydrology (all) and CFEV catchments, estuaries rivers and wetlands (integrated conservation value) layers

[3] Conservation of freshwater ecosystem values (CFEV).

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Feature	Detail	Information source
Groundwater	• There is only one groundwater bore registered within 500 m of the Property. This feature is located on the golf course, approximately 550 m north-east of the Property (upgradient). The bore was drilled in 2003 to a depth of 94.5 metres below ground level (bgl) and the shallowest recorded depth to the water was of 45.7 m bgl in Jurassic dolerite. This bore status is marked as “abandoned” • Inferred groundwater flow direction is to the south, towards Windermere Bay • The aquifer type beneath and surrounding the Property is described as porous (intergranular) of low to moderate prospectivity, located in Quaternary sands and gravel or Tertiary sediments, and highly vulnerable to pollution • Water was observed at the bottom of one of the excavated former fuel tank pits during previous investigations at the Cadbury Chocolate Factory (as shown in pitt&sherry, 2025), however, the investigation concluded that the water was seepage water from adjacent areas [presumably as groundwater within the Cadbury peninsula is more likely to be encountered near the Derwent River level, i.e. around 15 m bgl]; and • There are no identified groundwater protection areas within the Property or within a 2 km buffer.	GIAP[4] LISTmap – Groundwater prospectivity layer SHR (pitt&sherry, 2025)
Groundwater dependent ecosystems (GDE)	• Aquatic (surface): ○ Derwent River: moderate potential GDE from national assessment – GDE Atlas; and • No terrestrial or subterranean GDE have been recorded at or downgradient of the Property.	GDE Atlas[5] LISTmap – GDE layer SHR (pitt&sherry, 2025)

[4] Groundwater Information Access Portal (GIAP). Available at https://wrt.tas.gov.au/groundwater-info/
[5] Bureau of Meteorology (BOM). GDE Atlas. Available at http://www.bom.gov.au/water/groundwater/gde/map.shtml

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Feature	Detail	Information source
Geology	The geology beneath the Property is mapped as a combination of Undifferentiated Cenozoic sequences, including the following formations: • TQv – Supra-basalt moderately lithified conglomerate with, at places, ferruginous cement or interbedded sandstone, clasts of well-rounded cobbles and pebbles of quartz, quartzite, hornfels and traces of silicified wood, recycled Lower Parmeener lonestones, Tertiary derived silica, and rarely dolerite. This formation covers most of the Property, including the Cadbury factory and is located predominantly across the eastern, central and north-western portions • Tbs – Tholeiite basalt. This formation is present along the foreshore along the southern Property boundary, and within an area at the centre-north of the Property • TQds – Poorly-consolidated to unconsolidated sand, clayey labile sand, silt and subordinate clay and fine-grained gravel; includes deposits related to probable former course of Derwent River. This formation is only present within a limited area at the extreme west of the Propery; and • TQ – Undifferentiated Cenozoic sediments. This formation is present only along the northern boundary of the Property. The geology beneath the Site is predominantly the TQv formation, potentially extending to the Tbs formation near the foreshore.	LISTmap – Geology units 25k layer SHR (pitt&sherry, 2025)
Soils	• The soil landscape beneath the Property is mapped as “undifferentiated alluvial soils” and described as undifferentiated soils developed on Quaternary alluvium.	LISTmap – Soil types layer SHR (pitt&sherry, 2025)
Acid sulfate soils (ASS)	Based on the LISTmap database, the Property is predominantly outside any mapped ASS risk areas, with the exception of: • Low (6-70% chance of occurrence in mapping unit) and extremely low (1-5% of mapping unit) probability of occurrence of ASS areas at the northern boundary of the Property (outside the Site) • Low (6-70% chance of occurrence in mapping unit) probability of occurrence of ASS areas at the extreme west of the Property (outside the Site); and • High (>70% chance of occurrence in mapping unit) probability of occurrence of ASS in intertidal flats (south-west) and in subaqueous material in subtidal wetland (south) immediately adjacent to the Property (and the Site). Within the Atlas of Australian Acid Sulfate Soils, most of the Property is within areas of “extremely low” probability of occurrence of ASS, as discussed in the SHR (pitt&sherry, 2025).	LISTmap – inland ASS (>20 m AHD), coastal (0-20 m AHD) and Marine Subaqueous/Intertidal layers SHR (pitt&sherry, 2025)
Naturally occurring asbestos (NOA)	• There is no NOA mapped within the Property or within a 500 m buffer.	SHR (pitt&sherry, 2025)
Reserves	• There are no mapped reserves within or near the Property.	LISTmap – Tasmanian reserve estate layer

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Feature	Detail	Information source
Heritage	• Tasmanian Heritage Register (THR) – there are no recorded heritage sites within the Property, though some properties to the north are listed as the 'Cadbury Estate records' within the THR • The Property is listed as a Local Heritage Place (heritage place REF no. 0107) under the Local Historical Heritage Code of the Planning Scheme; and • Australian Heritage Database – there are no Australian-listed heritage sites within the Property or within a 200 m buffer.	LISTmap – Tasmania Heritage Register layer SHR (pitt&sherry, 2025)
Ecology	• Flora – no threatened flora has been mapped or recorded within the Property • Fauna – no threatened fauna species have been mapped or recorded within Property. The closest record of threatened fauna is for great crested grebe within the aquatic environment south-west to the Property; and • Raptor nests – no raptor nests or sightings have been recorded within the Property.	LISTmap – Threatened flora polygon, threatened fauna polygon and raptor nests layers
Vegetation	• Vegetation communities (TAS VEG 4.0): The entire Property is mapped as modified land – urban areas • There are no threatened native vegetation communities mapped within the Property; and • Weeds – A number of priority weeds and weeds listed under the *Weeds Management Act 1999*[6] have been recorded within or adjacent to the Property.	LISTmap – TASVEG 4.0, weeds watchlist polygon and, threatened vegetation communities layers SHR (pitt&sherry, 2025)
Geoconservation sites and karst features	• No geoconservation sites have been recorded within or adjacent to the Property; and • No CFEV karst features with integrated conservation value have been recorded within or adjacent to the Property.	LISTmap – geoconservation sites and CFEV karst – integrated conservation value layers
Wetlands	• There are no mapped wetlands or Ramsar wetlands within the Property or within a 2 km buffer; and • Windermere Bay and the whole extent of the Derwent River adjacent to the Property location is a CFEV estuary of very-high integrated conservation value.	LISTmap – wetlands, Ramsar wetlands and CFEV wetlands with integrated conservation value layers SHR (pitt&sherry, 2025)

[6] Replaced by the *Biosecurity Act 2019*.

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2.3 Natural hazards

A summary of natural hazards within the Property and Site is provided in Table 3.

Table 3: Natural hazards within the Property and Site

Natural Hazard	Detail	Information Source
Flood	• Some isolated flood prone areas are mapped at the northern portion of the Property, within the Cadbury Chocolate Factory area and parking lot across Cadbury Road (outside the Site).	LISTmap – TasWater flood inundation summary layer; Planning Scheme Code overlay layer SHR (pitt&sherry, 2025)
Coastal inundation	• Small areas along the Property (and Site) foreshore are mapped within coastal inundation hazard bands.	LISTmap – Coastal inundation hazard bands layer
Landslip	• Medium landslip hazard areas are present along the central and eastern portions of the foreshore at the Property (including within and adjacent to the Site).	LISTmap – Planning Scheme Code overlay layer SHR (pitt&sherry, 2025)
Soil erosion	• Areas of the Property are mapped as a combination of: o Very low to low hillslope erosivity hazard (majority of the Site) o Moderate and high wind erosion hazard (isolated parts of the Site) • Apart from the south-eastern portion of the foreshore (low hazard), the remainder of the Property (and Site) is mapped as acceptable hazard under the coastal erosion hazard mapping; and • It should be noted that a steep fill area was noted on Site during the Site inspection; the fill embankment on the southern side is likely to be prone to soil erosion.	LISTmap – Soil vulnerability (wind erosion and hillslope erosivity) layers SHR (pitt&sherry, 2025)
Fire	• The Property is not mapped as a bushfire-prone area within the Bushfire-prone Areas Code; and • No fires have been recorded within the Property.	LISTmap – fire history layer SHR (pitt&sherry, 2025)

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3. Site history review

The Site history has been investigated and documented in the SHR (pitt&sherry, 2025), which comprised a review of the Property title information and historical uses; the request for information regarding site contamination with the relevant authorities; review of available databases, including obtaining a professional report for databases and historical aerial imagery; and a Site inspection completed by the CEnvP SC.

At the completion of the SHR it was identified that intrusive investigations were required to investigate potential contamination onsite and assess the risks to human health and the environment.

3.1 Summary of potential contamination sources

Based on the SHR, the PCA identified for the Site are summarised in Table 4, with the ones considered to have potential to have impacted the Site indicated in the right-hand column.

Table 4: Summary of PCAs and their potential to impact the Site

PCA ID	PCA description	Potential to impact the Site
1	Cadbury Chocolate Factory: air emissions from natural gas and diesel boilers (contaminated particulate fall-out)	**Yes**
2	Cadbury Chocolate Factory: historic presence and operation of UPSS comprising two USTs at the premises; the Site is located laterally to the factory and not topographically or hydraulically downgradient of the factory	No
3	Cadbury Chocolate Factory: stormwater discharges; the Site is located laterally to the factory and not topographically or hydraulically downgradient of the factory	No
4	Cadbury Chocolate Factory: wastewater discharges; the Site is located laterally to the factory and not topographically or hydraulically downgradient of the factory	No
5	Cadbury Chocolate Factory: hazardous materials (storage and handling at the premises); the Site is located laterally to the factory and not topographically or hydraulically downgradient of the factory	No
6	Historic presence and operation of the railway alignment to the Cadbury peninsula (bisecting the Site), including potential impacts from rail infrastructure decommissioning works	**Yes**
7	Underground services (including telecommunications, gas, power, sewer and stormwater) bisecting the Site and connecting to the Cadbury factory; all underground service have the potential to have acted, or to act in the future, as preferential pathways for any mobile contamination	**Yes**
8	Landfilling mound located along the south eastern boundary of the Site, including building demolition rubble (BDR) and potential ACM and potentially other unknown wastes	**Yes**
9	Fill material at surface, including concrete potentially containing asbestos (ACM) along the foreshore, but outside the Site boundary	No[7]
10	Potential pesticide / herbicide use associated with landscaping maintenance of the Site and adjacent areas	**Yes**

The locations of these PCA in relation to the Site are shown in Figure 2 (Appendix A).

[7] This PCA had initially been considered to have potential to impact the Site in the SHR (pitt&sherry, 2025), but given the steep and elevated cliff face between the foreshore and the Site the risk is non-existent.

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4. Preliminary conceptual site model

A CSM is a representation of site-related information regarding contamination sources, likely receptors and potential exposure pathways between those sources and receptors. For contamination to pose a risk to likely receptors, exposure pathways must exist. The development of a CSM is an essential part of all site assessments and can provide the framework for identifying how a property became contaminated and how potential receptors may be exposed to identified confirmed or likely contamination either in the present or in the future (ASC NEPM).

The sources of potential contamination, nature of the contaminants of potential concern (CoPC), receptors, exposure pathways and data gaps identified in the preliminary CSM have been used as a basis for the development of the SAQP and for the determination of appropriate assessment criteria (presented in Section 5 and Section 6, respectively). The results of the intrusive investigations at the Site have been used in the source-pathway-receptor (SPR) linkage assessment presented in Section 8 to determine the level of risk posed by any identified or potential contamination.

The preliminary CSM considers the relevant requirements of the Planning Scheme, to ensure the objectives of this ESA are met.

4.1 Sources of potential contamination

As presented in Section 3, several PCAs have been identified as having potential to impact the Site:

- Cadbury Chocolate Factory (particulate fall-out)
- Historic presence, operation and decommissioning of the railway alignment to the Cadbury peninsula (bisecting the Site, which may have included treated timber sleepers
- Underground services (including telecommunications, gas, power, sewer and stormwater) bisecting the Site and connecting to the Cadbury factory
- Fill material mound located along the south-eastern boundary of the Site; and
- Potential pesticide / herbicide use associated with landscaping maintenance of the Site and adjacent areas.

Based on these PCAs, the following contamination sources have been identified:

- Particulate fallout from stack emissions from the Cadbury factory; and
- Potentially contaminated soils / fill (onsite and offsite).

4.2 Contaminants of potential concern

The primary CoPC relating to the identified PCAs (Section 4.1) include:

- ACM and asbestos fibres
- Metals and metalloids – arsenic (As), barium (Be), beryllium (Be), boron (B), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), lead (Pb), manganese (Mn), mercury (Hg), nickel (Ni), selenium (Se), vanadium (V), zinc (Zn) and chromium III (Cr III) and chromium VI (Cr VI)
- Hydrocarbons, including: benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAH); and total petroleum hydrocarbons (TPH) / total recoverable hydrocarbons (TRH)
- Phenoxyacid herbicides
- Dioxins and furans
- Sulphur oxides (SOx); and
- Oxides of nitrogen (NOx).

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4.3 Receptors

Potential receptors which may be exposed to identified CoPCs include the following:

- **Human receptors**
  - Intrusive maintenance workers (IMW) (i.e. excavation workers)
  - Future land users of the Site and surrounds under commercial/industrial and recreational land use settings, considering the proposed use of the Project and the setting within the existing Cadbury parkland area
- **Ecological receptors**
  - Onsite terrestrial fauna and flora (limited once the Site is developed); and
  - Aquatic ecosystem of Windermere Bay.

No other offsite human receptors were considered given the absence of beneficial users of groundwater and the very limited recreational use of surface water areas immediately downgradient of the Site in Windermere Bay.

4.4 Exposure pathways

Potential pathways through which receptors may be exposed to identified CoPC include:

- Inhalation of airborne contaminants including fibres and volatile hydrocarbons or other volatile organic compounds (VOCs), NOx and SOx vapours
- Direct contact with contaminated materials and/or soil, including ingestion due to poor hygiene practices
- Plant uptake and ingestion by onsite fauna (which is expected to be limited when the Site is developed and landscaped); and
- Migration of contaminants offsite to aquatic ecosystems.

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5. Sampling and analysis quality plan

The SAQP was developed considering the Site setting (Section 2), Site history review (Section 3), and the preliminary CSM (Section 4). The SAQP describes the data quality requirements and the sampling plan designed to assess the contaminant sources and migration pathways identified in the preliminary CSM.

5.1 Data quality objectives

The data quality objectives (DQOs) for this ESA are summarised in Table 5.

Table 5: Summary of data quality objectives

DQO	Details
The problem	• Potential presence of contamination from current and historical uses of the Site.
Investigation questions	• Investigation questions for this ESA include: o What is the current contamination status of soils at the Site? o What is the preliminary waste classification of sampled soils / fill materials for offsite disposal or suitability for onsite reuse? o Does the level of contamination (if any) at the sampled locations and media represent an unacceptable risk to human health and/or the environment under the proposed Site development and permitted uses (based on zoning) or during excavation; and o Are any management measures for soils, fill materials at the sampled locations likely to be required?
Inputs to the decision	• Information inputs for this ESA include: o Site setting (Section 2) o Site history review (Section 3) o Preliminary CSM (Section 4) o Assessment criteria (Section 6); and o Results and discussions (Section 7 and Section 8).
Boundary of the assessment	• Intrusive investigations were limited to: o Soil sampling within 6 test pits and 2 trenches within the Site, plus 2 hand auger locations along the adjacent walking track o 1 of the trenches extended slightly offsite to the southeast to address the landfill area to the southeast of the Site; and o Sampling locations are shown in Figure 3 (Appendix A).
Decision rules	• Comparison of reported concentrations of CoPC against adopted assessment criteria will allow: o The identification of any current contamination at the Site o An assessment of whether the level of contamination (if any) represents an unacceptable risk to human health and/or the environment in any of the exposure scenarios assessed o Allow preliminary (insitu) waste classification of soils / fill materials at sampled locations within the Site to be determined o Identification of whether any management measures are likely to be required for the Project, including during construction; and o Whether further assessment is required to assess the investigation questions listed above.

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DQO	Details

Acceptable limits on decision errors	Variation in data may arise from samples collected in succession from a single location due to the potential heterogenous nature of the sampled media (soil/fill material); possible inconsistencies in contaminant dispersion and fragments of materials may bias samples in certain elements.
	The overall objectives for quality assurance and quality control (QA/QC) samples are:
	• Blind triplicates should meet the following relative percentage differences (RPDs), or deviations from the target RPDs should be discussed and implications on the reliability of the dataset assessed:
	  ○ No RPD limit applies where values reported by laboratory are less than two times the laboratory limit of reporting (LOR)
	  ○ Where values reported by the laboratory are less than 20 times the LOR, then the calculated RPD should be less than 50%
	  ○ Where values reported by the laboratory are 20 to 100 times the LOR, then the calculated RPD should be less than 30%
	  ○ Where values reported by the laboratory are greater than 100 times the LOR, then the calculated RPD should be less than 15%; and
	• Trip blanks and rinsate blanks should not report concentrations of CoPC above the LORs, or detections should be discussed and implications on the reliability of the dataset assessed.

Design for obtaining data	Intrusive investigations were aimed at providing sufficient Site coverage for the Project footprint, addressing identified CoPC. Consideration was also given to the nature of any potential contamination and its expected spread within the Site (e.g. diffuse, localised, known location, etc.). Additional shallow investigations from 2 hand auger locations were proposed along the southern/downgradient side of the existing walking track, adjacent to the Site. The locations were selected to assess potential areas where the proposed new jetty access track(s) might join the existing track[8].
Laboratory analysis	All laboratory analysis shall be performed by NATA-accredited laboratories. The primary and secondary laboratories selected for the assessment included: • Primary Laboratory: ALS Environmental – Springvale, Victoria (accreditation no. 825); and • Secondary Laboratory: Eurofins MGT – Dandenong South, Victoria (accreditation no. 1261).

[8] Note that upon receiving the updated project footprint on 28/08/25, location CABH01 is no longer at the proposed connection to the new jetty access track.

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5.2 Sampling plan

The sampling plan for this ESA is summarised in **Error! Not a valid bookmark self-reference.**. The sampling locations are shown in Figure 3 (Appendix A).

A number of deviations to this sampling plan were implemented based on findings and observations during field work. These deviations are documented in Section 7.1.

Table 6: Sampling plan

Sample type / media	Location / reasoning	Method	No. of samples	Analytes
Soil / fill	6 test pits within the Site for sufficient coverage, including one location topographically downgradient of the historic railway alignment onsite.	• Test pits excavated with an excavator by an experienced excavator operator • Test pits excavated to natural ground or refusal; and • Collection of samples directly from the excavator bucket, or spoil piles adjacent to the test pits using single-use nitrile gloves and in accordance with the ASC NEPM AS 4482.1 and AS 4482.2.	• Generally 1 sample from the shallow soil profile plus 2 samples from deeper layers of the soil profile, assuming a maximum depth of around 1.5 m bgl (18 samples in total).	• Shallow samples o Metals and metalloids (15 metals suite) o Hydrocarbons (TRH/BTEXN/PAH) o Phenoxy acid herbicides, NOx, SOx, dioxins and furans (2 samples only, for screening purposes) • Deep samples o Asbestos fibres, presence and absence (where fill and BDR were noted) o Metals and metalloids (15 metals suite) o Hydrocarbons (TRH/BTEXN/PAH); and o Chromium III and VI (half of the samples only).
	Soil characterisation samples for the calculation of site-specific criteria.	• Samples collected from representative soil horizons within the test pits.	• Allowance for 2 samples for the entire investigation.	• ASC NEPM soil characterisation suite.

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Sample type / media	Location / reasoning	Method	No. of samples	Analytes
	2 trenches within the southeast portion of the Site where known landfilling is present.	• Trenches excavated with an excavator by a qualified civil contractor • Trenches excavated to natural ground or refusal; and • Collection of samples directly from the excavator bucket using single-use nitrile gloves and in accordance with the ASC NEPM AS 4482.1 and AS 4482.2.	• Allowance for 16 samples from the two trenches, distributed according to the fill layer disposition across the profiles.	• Asbestos fibres, presence and absence • Metals and metalloids (15 metals suite plus Cr II and Cr VI • Hydrocarbons (TRH/BTEXN/PAH) – trace level benzo(a)pyrene (B(a)P) • Leachable concentrations - Toxicity Characteristic Leaching Procedure (TCLP) – half of the samples only: o Metals and metalloids (15 metals suite; and o Hydrocarbons (TRH/BTEXN/PAH).
	2 hand auger locations immediately downgradient of the existing walking track, indicatively at/near the proposed locations of intersection with the new access track(s) from the proposed new passenger jetty[9].	• Hand auger down to approximately 0.5 m bgl; and • Collection of samples from hand auger using single-use nitrile gloves and in accordance with the ASC NEPM AS 4482.1 and AS 4482.2.	• Allowance for 1 sample per location.	• Metals and metalloids (15 metals suite) • Hydrocarbons (TRH/BTEXN/PAH); and • Phenoxy acid herbicides.
BDR	ACM sampling	• Collection of fragments of BDR potentially containing bonded asbestos material for confirmation of whether it is ACM.	• Allowance for 10 samples throughout the investigation.	• Asbestos in bulk solids (ACM testing).

[9] Note that upon receiving the updated project footprint on 28/08/25, location CABH01 is no longer at the proposed connection to the new jetty access track.

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Sample type / media	Location / reasoning	Method	No. of samples	Analytes
QA/QC	Blind triplicate set (soil)	Blind triplicate set sampled following the same sampling method as their primary sample.	2 samples (rate of 1 triplicate set (2 samples) per each 20 primary samples).	Same analytes as primary samples.
	Rinsate blank	Rinsate blank to be collected from reusable equipment after decontamination procedure using laboratory supplied rinsate waters.	1 (from hand auger)	• Metals and metalloids (15 metals suite); and • Hydrocarbons (TRH/BTEXN/PAH)
	Trip blank	Trip blank supplied by the laboratory.	1 (rate of 1 trip blank per batch of samples submitted to the laboratory).	• TPH/TRH (C_6-C_{10}) and BTEXN.

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6. Adopted assessment criteria

Adopted assessment criteria are provided in Table 7.

The adopted criteria are based on the proposed commercial / industrial development and its location and access through the existing Cadbury parkland area.

ASC NEPM health screening levels (HSL) criteria for vapour intrusion considered the depth at which the samples were taken, as presented in the summary results tables in Appendix D.

Table 7: Summary of adopted assessment criteria

Sample type/ matrix	Adopted assessment criteria		
	Human health	**Ecological**	**Waste management**
Soil / Fill	ASC NEPM HIL / HSL D Commercial / Industrial	ASC NEPM EIL / ESL Residential / public open space	Tasmania EPA IB105 Waste classification
	ASC NEPM HIL / HSL C Recreational	ASC NEPM EIL / ESL Commercial / industrial	-
	CRC CARE HSL D Commercial / Industrial - Direct Contact	-	-
	CRC CARE HSL C Recreational - Direct Contact	-	
	CRC CARE HSL IMW shallow trench – vapour intrusion and direct contact	-	-

Notes
ASC NEPM: *National Environment Protection (Assessment of Site Contamination) Measure, 1999, amended 2013.*
CRC CARE *Technical Report No. 10, Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, Part 2, Application Document*, September 2011.
EIL / ESL: ecological investigation level / ecological screening levels
HIL / HSL: health investigation level / health screening level
IMW: intrusive maintenance worker

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7. Results and discussion

7.1 Deviations to the sampling plan

The following deviations to the proposed sampling plan were implemented during the field work:

- No ACM-like material was observed during the intrusive investigations, therefore no ACM testing was completed
- Ballast was found at one of the hand auger locations adjacent to the existing walking track. A ballast sample was collected and submitted to the laboratory to be tested for leachable concentrations of metals (As, Cd, Cr, Cu, Hg, Pb, Ni and Zn) and hydrocarbons (TPH/TRH, BTEXN and PAH). Given the coarse nature of the ballast and no availability for crushing into smaller pieces, the standard laboratory leaching procedures could not be applied and therefore the ballast analyses was **not** issued under the NATA certification
- A total of 4 samples were collected from the hand auger locations (1 sample from CABH01 and 3 samples from CABH02, including the ballast sample). Samples were taken to address the different layers of the soil profile observed onsite
- Test pits CATP02, CATP03, reached natural ground at shallow depths, with limited fill layers and therefore only 2 samples were collected in each of these test pits (1 shallow sample and 1 deep sample)
- Trench CATR01 was cleared of underground services along approximately 20 m length, starting at the southeastern corner of the Site and extending over the landfill area southeast of the Site. Due to the length of the area earmarked for excavation, this trench was split into 6 segments (A to F). Due to time constraints in the field, only segments A, C, D and F were excavated. Based on visual observations of excavated segments, it was inferred that segment B would present a soil profile similar to segment A, and that segment E would present a soil profile similar to segment F. Sampling from this trench alignment targeted the different fill layers of the profile, and therefore at the completion of the excavation, samples were collected from segments A, C and F only, as the materials/layers observed in segment D were similar to segment C and A. A total of 12 samples were collected from this trench (2 from segment A; 4 from segment C; and 6 from segment F)
- Trench CATR02 was excavated through a length of approximately 3 m and remained within the Site boundary. Refusal on sandstone rock was reached at around 1 m bgl, and therefore only 3 samples were collected from the identified horizons in this trench; and
- Leachable concentrations were initially tested in the fill material samples collected from segments A and F (except for deepest sample from segment F, assumed to be from the original natural ground level) of trench CATR01, and from the two deeper fill material samples of trench CATR02, given the shallow sample was considered to be representative of the topsoil onsite. Additional jars were collected from all samples from the trenches to allow for potential TCLP testing if initial leachate results suggested it was required for preliminary waste classification, however, based on the results reported, no additional leachate testing was carried out (refer Section 7.3.2).

7.2 Visual observations and field screening

Intrusive investigations were completed on 7 and 8 July 2025 in accordance with the SAQP and comprised the following:

- Excavation of two hand auger boreholes (CABH01 to CABH02) to a maximum depth of 0.5 m bgl
- Excavation of six test pits (CATP01 – CATP06) spread evenly across the Site; and
- Excavation of two trenches (CATR01 – CATR02) in the southeastern corner of the Site, towards the edge of the embankment. Trench CATR01 was further split into 6 smaller segments named from A to F of which only 4 segments were excavated.

The general soil profile observed from the investigation locations are provided in Table 8.

The field screening of soils for volatile organic compounds (VOCs) using a photoionization detector (PID) returned typically a 0 ppm reading with only three readings above 0 ppm, all in CABH02, with a maximum reading of 3.8 ppm.

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The readings suggest an absence of VOCs at the investigated locations.

Field logs for the intrusive investigations are provided in Appendix B and the photographic report is provided in Appendix C.

Table 8: Summary of visual observations and field PID measurements – soil

Location	Depth (m)	Sample ID	Material description	PID (ppm)
CABH01	0.0-0.1	-	Loamy sand	0
	0.1-0.5	CABH01/0.3	Loamy sand	0
CABH02	0.0-0.1	-	Loamy sand	1.5
	0.1-0.4	CABH02/0.3	Sandy loam	3.8
	0.4-0.5	CABH02/0.4	Sandy clay	0.4
CATP01	0.0-0.2	CATP01/0.1	Fine crushed rock (FCR) and sandy loam	0
	0.2-0.5	CATP01/0.3	Clayey sand with gravel	0
	0.5-0.8	CATP01/0.4	Thick clay with gravel	0
CATP02	0.0-0.2	CATP02/0.1	Loamy sand	0
	0.2-0.6	CATP02/0.4	Silty sand	0
	0.6-1.2	CATP02/0.8	Clayey sand with gravel	0
CATP03	0.0-0.5	CATP03/0.3	Loamy sand	0
	0.5-1.2	CATP03/0.7	Silty sand with clay	0
CATP04	0.0-0.3	CATP04/0.2	Loamy sand with gravel	0
	0.3-0.6	CATP04/0.4	Gravelly sand	0
	0.6-1.4	CATP04/0.7	Clay with sand	0
CATP05	0.0-0.2	CATP05/0.1	Loamy sand with gravel	0
	0.2-0.6	CATP05/0.4	Gravelly sand with clay	0
	0.6-1.1	CATP05/0.8	Thick clay with gravel	0
	1.1-1.2	-	Clayey sand with rounded gravel	0
CATP06	0.0-0.2	CATP06/0.1	Sandy loam	0
	0.2-0.5	CATP06/0.3	Coarse sand with gravel	0
	0.5-0.8	CATP06/0.5	Thick clay with gravel	0
	0.8-1.2	CATP0.6/0.7	Coarse sand with clay	0
CATR01-F	0.0-0.2	CATR01-F/0.1	Loamy sand with gravel	0
	0.2-0.8	CATR01-F/0.5	Clayey sand with gravel	0
	0.8-1.8	CATR01-F/1.2	Sand with gravel	0
	1.8-2.0	CATR01-F/1.9	Sand with gravel	0
	2.0-2.8	CATR01-F/2.4	Gravelly sand with clay	0
	2.8-3.2	CATR01-F/3.0	Clayey sand	0
CATR01-C	0.0-0.4	CATR01-C/0.2	Gravelly sand	0
	0.4-0.7	CATR01-C/0.5	Gravelly sand	0
	0.7-1.0	CATR01-C/0.9	Silty sand with clay and gravel	0
	1.0-1.2	CATR01-C/3.0	Clayey sand	0
CATR01-D	0.0-0.4	-	Gravelly sand	0
	0.4-0.7	-	Gravelly sand	0
	0.7-1.0	-	Silty sand with clay and gravel	0
	1.0-1.2	-	Clayey sand	0
CATR01-A	0.0-0.2	CATR01-A/0.1	Sandy loam	0

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Location	Depth (m)	Sample ID	Material description	PID (ppm)
	0.2-0.5	CATR01-A/0.3	Clayey sand with gravel	0
	0.5-1.7	-	Clay with gravel	0
CATR02	0.0-0.2	CATR02/0.2	Sandy loam	0
	0.4-0.8	CATR02/0.5	Sandy loam	0
	0.8-0.9	CATR02/0.9	Silty sand	0
	0.9-1.0	-	Gravelly sand	0

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7.2.1 Odours and stains

Generally, no notable odours or stains have been observed through the fill and soil profiles at the investigation locations. While no stains were noted, some coal/ash and likely bituminous materials have been observed within the profile in some locations, as discussed below.

7.2.2 Fill and waste materials

Fill material was present in most the investigation locations, with natural soils consisting mostly of hard packed clays on top of sandstone, which is consistent with the geology formation onsite of undifferentiated Cenozoic sequences described as "*supra-basalt moderately lithified conglomerate with at places ferruginous cement or interbedded sandstone*" as per description from the LISTmap 25k geology database.

The depth of the fill and its composition varied across the locations, but was generally a combination of sands and gravels with re-worked natural clays in some locations. The fill was usually shallower in the north and west of the Site (usually ranging from 0.6 to 1 m bgl) and deepening to the south and east, towards the known landfill area, where natural soils were observed only from 2.8 m in the deepest trench segment (CATR01-F).

Some of the fill material found in the deeper areas of CATR01 included reworked natural materials assumed to be from different locations, including potentially coastal and marine sediments, as carbonaceous materials were present within the profile (Plate 1).



Plate 1: Mixed fill profile within CATR01-F with carbonaceous materials present

Ballast was observed at the hand auger location CABH02 along the walking track, which corresponds to the historical railway alignment, suggesting that some railway infrastructure and/or materials may still remain in some areas of the former alignment.

BDR was also observed within the fill materials at CATP01, CATP02, CATP06, CATR01-A, CATR01-F and CATR02, usually consisting of concrete fragments. Some bituminous materials were observed near the interface with natural sandstone at CATR01-C and CATR02 and a thin black layer of coal/coal ash mixed with fill was observed in CATR01-F (Plate 2).

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Plate 2: Mixed fill profile within CATR01-F with layer of bituminous material within the fill profile

Sundry wastes were only observed within fill layers at CATP01 (broken cup), CATR01-A (broken cup fragment) and CATR01-F (plastic waste and decomposing timber). The apparent rare occurrence of sundry wastes and the predominance of sands and gravels at most locations suggests the fill materials placed on the Site and in the landfill adjacent to the Site, may have been screened as relatively clean waste soil.

It should be noted that during the Site inspection (pitt&sherry, 2025) documented in the SHR, large broken concrete segments were noted around the outer, southern perimeter of the landfill area. Another area with a stockpile of debris (including glass, metal, plastic, brick and concrete) was observed further to the south-east, closer the cliff face. Debris was also visible at the bottom of the cliff, likely eroded from the stockpile above.

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7.2.3 Buried infrastructure

As reported in the SHR (pitt&sherry, 2025), a Site wide underground services survey has been conducted, which has mapped the extent of the underground services within the area. However, during the intrusive investigations onsite, two parallel concrete structures were observed in the southwest corner of the Site, near the beginning of the walking track, suggesting historic buried infrastructure could be present. Furthermore, while BDR and sundry wastes were seldom present within the fill layers in the excavated test pits, some evidence of concrete rubble was seen across the surface of the Site (refer to Plate 3 and photographic report in Appendix D).





Plate 3: Parallel concrete features (left) and concrete rubble on surface (right) observed during intrusive investigations onsite

Buried structures could be associated with historic uses of the Site, such as the historic railway alignment and associated infrastructure, and the operation of the Cadbury factory.

7.3 Analytical results

All laboratory documents, i.e. certificates of analysis (CoA), chain of custody forms (CoC), sample receipt notifications (SRN), and internal laboratory quality certificates (QC and QCI reports) are provided in Appendix E.

A total of 36 soil samples were collected from the 6 test pits, 2 trenches and 2 hand auger boreholes excavated at the Site.

The summary results table for the soil samples, including adopted assessment criteria, is provided in Appendix D. The results of the soil classification samples collected for the calculation of the site-specific EILs for selected heavy metals is provided along with the summary results tables.

A summary of the exceedances of the adopted assessment criteria is provided in Table 9.

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Table 9: Summary of exceedances to the adopted assessment criteria – soil

Sample ID/depth	Human health			Ecological		Waste management		
	ASC NEPM HIL/HSL C and D	CRC CARE HSL C and D (Direct contact)	CRC CARE HSL IMW	ASC NEPM EIL/ESL Residential / open space	ASC NEPM EIL/ESL Commercial / industrial	IB105 Level 1	IB105 Level 2	IB105 Level 3
CABH02/0.3 (Ballast)	NE	NE	NE	NE	NE	NE	NE	NE
CABH01/0.3	NE	NE	NE	NE	NE	NE	NE	NE
CABH02/0.3	NE	NE	NE	Ni	Ni	As, Cr, Ni	NE	NE
CABH02/0.4	NE	NE	NE	Ni	Ni	Cr, Ni	NE	NE
CATP01/0.1	NE	NE	NE	NE	NE	NE	NE	NE
CATP01/0.3	NE	NE	NE	NE	NE	NE	NE	NE
CATP01/0.4	NE	NE	NE	NE	NE	NE	NE	NE
CATP02/0.1	NE	NE	NE	NE	NE	NE	NE	NE
CATP02/0.4	NE	NE	NE	NE	NE	NE	NE	NE
CATP02/0.8	NE	NE	NE	NE	NE	NE	NE	NE
CATP03/0.2	NE	NE	NE	NE	NE	NE	NE	NE
CATP03/0.7	NE	NE	NE	NE	NE	NE	NE	NE
CATP04/0.2	NE	NE	NE	NE	NE	NE	NE	NE
CATP04/0.4	NE	NE	NE	NE	NE	NE	NE	NE
CATP04/0.7	NE	NE	NE	NE	NE	NE	NE	NE
CATP05/0.1	NE	NE	NE	Ni	Ni	NE	NE	NE
CATP05/0.4	NE	NE	NE	NE	NE	NE	NE	NE
CATP05/0.8	NE	NE	NE	NE	NE	NE	NE	NE
CATP06/0.1	NE	NE	NE	Zn	NE	NE	NE	NE
CATP06/0.3	NE	NE	NE	NE	NE	NE	NE	NE
CATP06/0.5	NE	NE	NE	NE	NE	NE	NE	NE
CATR01-F/0.1	NE	NE	NE	Ni	NE	NE	NE	NE
CATR01-F/0.5	NE	NE	NE	NE	NE	NE	NE	NE
CATR01-F/1.2	NE	NE	NE	NE	NE	NE	NE	NE
CATR01-F/1.9	NE	NE	NE	NE	NE	NE	NE	NE
CATR01-F/2.4	NE	NE	NE	Ni, Zn	Ni	NE	NE	NE
CATR01-F/3.0	NE	NE	NE	Ni	Ni	Cr	NE	NE
CATR01-C/0.2	NE	NE	NE	Ni	NE	NE	NE	NE
CATR01-C/0.5	NE	NE	NE	Ni	Ni	As	NE	NE
CATR01-C/0.9	NE	NE	NE	NE	NE	As	NE	NE
CATR01-A/0.1	NE	NE	NE	Ni, Zn	Ni	As, B(a)P	NE	NE
CATR01-A/0.3	NE	NE	NE	NE	NE	NE	NE	NE
CATR02/0.2	NE	NE	NE	NE	NE	NE	NE	NE
CATR02/0.5	NE	NE	NE	As, Cu, Ni, Zn	Ni, Zn	As, B(a)P	NE	NE
CATR02/0.9	NE	NE	NE	Ni	Ni	As	NE	NE

Notes:

Shaded cells: exceedances of adopted assessment criteria - exceeding analyte(s) reported within the cell.

B(a)P – Benzo(alpha)pyrene

NE: No exceedance reported for the contaminants tested

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7.3.1 Human health and ecological risks

Leachability testing of ballast

The ballast sample collected from CABH02 adjacent to the walking track reported all leachable concentrations of metals and hydrocarbons (TPH/TRH and PAHs) below the laboratory LOR. While the laboratory results for this sample could not be issued under the NATA accreditation, the results are considered indicative of the low risk of residual contamination at this location within these ballast materials.

Asbestos, synthetic mineral fibres and organic fibres

No asbestos fibres have been positively identified throughout the dataset and no ACM-like materials were visibly noted through the soil/fill profiles at the investigation locations. Fill materials consisted predominantly of gravels, sands and some fines, sometimes including re-worked natural materials, with BDR being observed seldom in the soil profile, usually as concrete fragments (mostlyat surface) and as thin layers of coal/ash bituminous materials within the profile in some locations (refer to Section 7.2.2).

Synthetic mineral fibres (SMF) have been positively identified in some of the samples tested. SMF is a generic term used to collectively describe several amorphous (non-crystalline) fibrous materials including glass fibre, mineral wool and ceramic fibre. Glassfibre and mineral wool have been used for many decades. The major application of SMF materials is in thermal and acoustic insulation, and as a reinforcing agent. In some specialised instances, these materials have been used as a replacement for asbestos, in particular where high temperature insulation properties are required. Ceramic fibre has also been used to replace refractory brick and mortar materials. Because of their similar application and appearance to asbestos, there has been some concern in the community regarding the health effects associated with exposure to SMF (NOHSC:1004(1990))[10]. While the impacts of exposure to SMF are generally less concerning then asbestos fibres, there are still several complications that could arise from inhalation of SMF, ranging from irritation and rashes until chronic respiratory conditions such as lung fibrosis, especially in prolonged exposure scenarios. Some SMF have also been classified as possibly carcinogenic, though the fibres are designed to be less bio persistent.

While the presence of SMF within some of the fill layers onsite do not warrant any active remediation requirements, it is recommended that dust suppression is employed during construction works to mitigate risks from SMF becoming airborne during earthworks onsite.

Organic fibres have also been positively identified in some of the samples in the dataset. Organic fibres generally do not pose risks to human health or the environment and are likely associated with vegetation rootlets. Therefore, these results do not warrant any active remediation requirements.

Herbicides

Phenoxyacetic acid herbicides have been tested in a number of samples from the shallow profile of the test pits, trenches and boreholes to account for the potential herbicide use within the Cadbury parkland area. Reported concentrations of all herbicides were below the laboratory LORs, suggesting no residual herbicide contamination is present.

Dioxins and furans, NOx and SOx

Dioxins and furans, oxides of nitrogen and sulphur oxides (measured as total sulphur) have been tested in two samples from the shallow horizon of the soil profile in two test pits as a screening tool for the potential impact from particulate fall-out from the Cadbury factory, due to the factory's regulated air emissions under the national pollutant inventory (NPI).

Both samples reported results for all tested dioxins and furans below the laboratory LORs (refer to the certificate of analysis in Appendix E).

[10] *National Standard for Synthetic Mineral Fibres*, National Occupational Health and Safety Commission, May 1990 (NOHSC:1004(1990)).

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Sample CATP01/01 reported total sulphur as 0.02% and NOx as 2.3 mg/kg, while sample CATP05/0.1 reported total sulphur as 0.13% and NOx as 0.1 mg/kg.

NOx compounds are usually present in soils as nitrate or nitrite. Agricultural soils often contain 5–50 mg/kg of nitrate (as nitrogen)[11], so both samples reported concentrations well below typical agricultural levels, suggesting minimal nitrogen loading from the adjacent industrial activity.

Natural background levels of sulphur in Australian soils typically range from 100 to 500 mg/kg, depending on soil type and environmental conditions[12]. While sample CATP01/0.1 reported sulphur concentrations well within this range (0.02% = 200 mg/kg), sample CATP05/0.1 reported concentrations more than two times the higher end of the natural range (0.13% = 1,300 mg/kg), suggesting a potential contribution from the adjacent industrial activity, or from placement of impacted fill, or potentially from other unidentified sources.

Note that background levels of sulphur have not been measured.

While sulphur typically does not represent a direct concern to human health, there are ecological concerns associate with high sulphur concentrations, including acid generation if the material is waterlogged and disturbed (oxidised) – i.e. potential for material to be ASS. Other ecological impacts are associated with plant health and microbial activity, with high sulphur concentrations in soils potentially altering nutrient uptake and soil fertility, though this is less relevant for the current and proposed land use at the Site and surrounds. Overall, the slightly elevated sulfur concentrations do not appear to be impacting on the growth of any of the existing plantings within the Cadbury parkland, and is therefore not expected to be of concern for the development.

Metals and metalloids

Concentrations of most metals and metalloids were reported above the LORs, though well below adopted human health criteria.

Some samples reported nickel and zinc concentrations above the urban residential / public open space site-specific EILs. Arsenic and copper were also reported above the urban residential / public open space EILs in one sample (CATR02/0.5).

When considering the commercial / industrial land use scenario, only nickel and one zinc result were reported in exceedance of their respective EILs. Nickel exceedances of the commercial / industrial EILs are considered to be a reflection of the very similar calculated site-specific criterion for residential / public open space (6 mg/kg) and commercial / industrial (7 mg/kg) land use scenarios.

The exceedances were predominantly reported at locations within the proposed building footprint onsite (CATP05, CATP06, CATR01-A, CATR01-C and CATR02), with some exceedances also reported within the fill material offsite, to the southeast of the building footprint (CATR01-F), and at the walking track west of the Site (CABH02).

Reported exceedances were generally only slightly above the criteria, with the statistical analysis showing that the 95% upper confidence limit (UCL) is within the nominated criteria for all analytes except nickel, which still slightly exceeded the site-specific criterion. It is worth noting that the nominated site specific EILs correspond to the added contaminant limits (ACLs) only. Site specific EILs are typically determined by adding the site-specific ACL to a background concentration for the Site. As no background concentration was added, the ACL is considered slightly conservative. Furthermore, no ecological receptors are expected within the building footprint onsite.

Based on the reported concentrations, the identified exceedances of the site-specific EILs (ACLs) are considered unlikely to pose an unacceptable risk to ecological receptors. In addition, it appears from the proposed design that the Site will be predominantly sealed, which will limit access to soils for flora and fauna. Any unsealed areas are expected to be landscaped.

[11] Grace P et al., 2024.
[12] University of Adelaide, 2020.

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Hydrocarbons

Only trace concentrations of hydrocarbons (predominantly TRH F3 fraction and PAH) were reported in some samples well below the adopted human health and ecological criteria.

Detected concentrations of hydrocarbons do not pose an unacceptable level of risk to human health or ecological receptors.

7.3.2 Preliminary waste classification

It is expected that some materials will be removed from the Site during the construction phase, either for ground profiling or for geotechnical stability. Removed soils and fill materials will require further sampling and waste classification in accordance with IB105 prior to offsite disposal.

All collected soil and fill material samples have been tested for total concentrations of CoPCs, and some selected samples, predominantly from trench CATR01 given its location within the south of the Site and over the known buried fill area, have also been tested for leachable concentrations to allow for a waste classification in accordance with IB105.

Results show that total concentrations of As, Cr and Ni, and benzo(a)pyrene exceeded the *level 1 – fill material* criteria of IB105 in a few samples within the dataset. All other results, including leachable concentrations in selected samples, were below the respective criteria. Exceedances of Level 1 criteria were reported for:

- CABH02 adjacent to the walking track (offsite)
- CATR01-C and CATR01-F within the buried fill area to the south-east of the Site (offsite); and
- CATR01-A and CATR02 **within** the southern portion of the Site footprint.

Therefore, the preliminary waste classification suggests that the materials onsite would be predominantly classified as *Level 1 – fill material* in accordance with IB105, except for the southern portion of the Site where *Level 2 – low-level contaminated soils* can occur in certain layers of the fill profile. Furthermore, the landfill area to the south-east of the Site and shallow layers of the profile along the walking track leading to the Site are also indicatively classified as *Level 2 – low-level contaminated soils*.

Figure 3 within Appendix A shows the indicative boundary of the areas where Level 2 waste materials would be present, based on the preliminary waste classification completed in this ESA. Sampling and analysis of excavated stockpiled materials must be conducted during the construction stage to confirm the waste classification prior to offsite disposal.

Note that offsite disposal of any material classified as level 2 or above requires pre-approval from the EPA.

If materials from the indicative areas with Level 2 wastes are to be reused onsite, the reuse of these materials should be prioritised within the building footprint or beneath topsoil in planted areas, as discussed in Section 7.3.3 below.

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7.3.3 Onsite reuse

Based on the absence of exceedances of the human health criteria, all the materials within the investigation area are suitable for onsite reuse from a human health perspective provided:

- Where present, the coarse inert material (including BDR) is segregated, as to not pose an aesthetic impact; and
- Soils and fill materials to be reused onsite are not stained and free of odours.

While the exceedances of ecological criteria are not considered to pose an unacceptable level of risk and therefore also considered suitable for onsite reuse from the ecological perspective, it is recommended that some of the materials within the investigation area where these exceedances were reported, particularly from CABH02 along the walking track and from both the trenches (CATR01 A to F and CATR02), are either:

- Reused within the building footprint; or
- Covered with topsoil in planted areas.

The exceedances of the ecological criteria are generally aligned with the exceedances of level 1 waste classification criteria, therefore these recommendations account for both these aspects.

7.3.4 Review of QA/QC results

In accordance with the SAQP (Section 5), the following QA/QC samples were collected/submitted:

- Two blind triplicate sets (4 samples)
- One rinsate sample; and
- One trip blank sample.

Soil triplicate results reported RPDs within the established criteria, except for a single fail between the primary and secondary laboratory samples for the Pb concentrations, which reported an RPD slightly above the criterion. This result is likely representative of the heterogeneous nature of soils and does not compromise the reliability of the dataset.

The trip blank sample reported concentrations of tested CoPC below the LORs.

The rinsate blank sample collected from the hand auger reported detected concentrations of metals: arsenic, chromium, nickel and zinc. These results suggest that the decontamination procedure was not effective to completely clear the sampling equipment from residual materials between sampling locations, and therefore there is a risk that minor cross contamination of metals may have occurred between the two hand auger sampling locations. While this result is not optimal, it is worth noting that the hand auger was used only for two locations (CABH01 and CABH02), both within the same area along the walkway offsite, and the reminder of the investigation locations were sampled directly from the spoil piles placed next to the excavated areas, with no re-usable hand tools used. Furthermore, the metals concentrations in the sample from CABH01 and CABH02 have very different metals concentrations, with the latter having much higher concentrations than CABH01 which suggests that actual cross contamination between locations is unlikely to have occurred at levels that would have impacted on the sample results. Therefore, in this instance, the reported concentrations in the rinsate sample are considered to not compromise the reliability of the dataset.

QA/QC result tables are provided together with the summary result tables in Appendix D.

In addition to the QC samples collected in the field, the laboratory also runs internal QA/QC testing. All internal laboratory QA/QC reports are provided along with the certificate of analysis in Appendix E. Laboratory QA/QC results are summarised in Table 10. Where applicable, a discussion is also provided after the description of the outliers.

Despite the outliers listed and discussed in Table 10 as part of the laboratory QA/QC assessment, the overall number of samples tested and consistency of results from this investigation suggest that the data set is robust and results can be considered representative of the concentrations of tested CoPC at the locations and time of sampling.

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Table 10: Summary of intra laboratory QA/QC results

Work Order	QA/QC	Result	Discussion
ALS EM2512262	Method Blank	No outliers occurred	-
	Laboratory Control	No outliers occurred	-
	Duplicates	No outliers occurred	While outliers are reported in the laboratory quality control report, these are related to “anonymous” samples, and therefore refer to samples from different client rather than from samples submitted within this project.
	Matrix Spikes	Recovery for hexavalent chromium in sample CATP02/0.4 lower than data quality objective.	Some level of matrix interference was noted for hexavalent chromium in this sample, however, all samples reported hexavalent chromium below the LOR, therefore, given the recovery only marginally below the data quality objective, this result is not considered to impact the reliability of the dataset. While other outliers are reported in the laboratory quality control report, these are related to “anonymous” samples, and therefore refer to samples from different client rather than from samples submitted within this project.
	Surrogate Recovery	No outliers occurred	-
	Analysis Holding Times	Due date for extraction for analysis of pH and conductivity, and due date for analysis of NOx in soils was exceeded by 1 day	pH and conductivity analysis were only requested for the soil characterization samples. These analytes usually return as outliers given their short holding time. NOx analysis was due by only one day. pitt&sherry has no control over the extraction and analysis of samples other than delivering samples to the courier as soon as possible. Overall, these outliers are not considered to lower the reliability of the dataset.
	Quality control sample frequency	Laboratory duplicate and matrix spikes sample frequency for the water sample was not met for TRH, leachable mercury and PAH analysis.	pitt&sherry has no control over laboratory duplicate other than providing enough sample to the laboratory. Overall, pitt&sherry does not consider that this outlier compromises the reliability of the dataset.
Eurofins 1243068-S	Method Blank	No outliers occurred	-
	Laboratory Control	No outliers occurred	-
	Duplicates	No outliers occurred	-
	Matrix Spikes	No outliers occurred	-

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8. Source-Pathway-Receptor linkage assessment

The preliminary CSM presented in Section 4 was developed to identify potential contamination sources, CoPC and receptors, which allowed the identification of potentially significant SPR linkages in relation to human health and the environment. The SAQP (Section 5) was then structured based on this information, being designed to allow the collection of sufficient data to assess the completeness and significance of these scenarios during the intrusive investigations at the Site.

The SPR linkage assessment comprises the evaluation of the scenarios from the preliminary CSM in light of the results from the intrusive investigations (Section 7) and the Tier 1 risk assessment made with the adopted criteria (Section 6). Unacceptable risks from contamination may occur if the SPR linkage is complete.

The assessment limitations and variations to the SAQP has resulted in remaining data gaps, which are identified in Section 8.1. A risk assessment is provided in Section 8.2.

SPR linkages for the various combinations are provided in Table 11, with colour coding as follows:

- Green shading indicates the SPR linkage is unlikely to be complete or is low risk
- Blue font indicates remaining data gaps; and
- Red font indicates mitigation or management measures recommended, including measures under Construction Environmental Management Plan (CEMP) or equivalent during the construction stage.

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Table 11: Assessment of source, pathway, receptor linkages

Source	Pathway	Human Receptors		Ecological receptors	
		IMW	Future land users (commercial / industrial and recreational)	Onsite fauna and flora	Aquatic ecosystem of Windermere Bay
Particulate fallout from the Cadbury factory	Inhalation of airborne contaminants	The screening assessment for particulate fallout related contaminants suggests no presence of any contaminants at concentrations that could pose direct risk to human health, therefore, there is no risk from airborne contaminants (NOx, SOx and dioxins and furans) to impact IMW (e.g. via dust generation).	The screening assessment for particulate fallout related contaminants suggests no presence of any contaminants at concentrations that could pose direct risk to human health, therefore, there appears to be no risk from airborne contaminants (NOx, SOx and dioxins and furans). Furthermore, future land users are unlikely to be exposed to these contaminants, as no dust generation is expected once construction is complete.	The screening assessment for particulate fallout related contaminants suggests no presence of any contaminants at concentrations that could pose direct risk to terrestrial fauna and flora, therefore, there appears to be no risk from airborne contaminants (NOx, SOx and dioxins and furans) to impact ecological receptors.	Pathway not relevant for this receptor.
	Direct contact with contaminated materials and/or soil	The screening assessment for particulate fallout related contaminants suggests no presence of any contaminants at concentrations that could pose direct risk to human health therefore, there's no risk from NOx, SOx and dioxins and furans to impact IMW.	The screening assessment for particulate fallout related contaminants suggests no presence of any contaminants at concentrations that could pose direct risk to human health therefore, there's no risk from NOx, SOx and dioxins and furans to impact future land users.	The screening assessment for particulate fallout related contaminants suggests no presence of any contaminants at concentrations that could pose direct risk to terrestrial fauna and flora therefore, there's no risk from NOx, SOx and dioxins and furans to impact ecological receptors.	No direct risks have been identified associated with particulate fallout impacts on the Site soils. Given the absence of dioxins and furans and normal levels of NOx observed in the screening assessment, the slightly higher sulfur concentrations reported are likely related to the types of fill rather than particulate fallout, therefore the risks are addressed under the "onsite contaminated soils" row.

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Source	Pathway	Human Receptors		Ecological receptors	
		IMW	Future land users (commercial / industrial and recreational)	Onsite fauna and flora	Aquatic ecosystem of Windermere Bay
Onsite contaminated soil	Inhalation of airborne contaminants, including fibres, hydrocarbon vapours and dust	SMF have been positively identified in some samples, which could cause upper respiratory tract irritation or other minor adverse effects from short term exposure during the construction stage. All other reported concentrations of CoPC were below adopted human health criteria. Effective dust control measures should be put in place during the construction stage to limit exposure of workers to SMF potentially present within the Site soils and/or fill material. These measures should be implemented as part of a CEMP.	SMF have been positively identified in some samples, however, there is no direct exposure pathway to future Site users, as no dust will be generated during the operational stage. All other reported concentrations of CoPC were below adopted human health criteria.	SMF have been positively identified in some samples, however, terrestrial fauna are unlikely to be exposed to dust generated during construction, given construction works are expected to cause wildlife deterrence, leading to temporary displacement of fauna from the area.	Pathway not relevant for this receptor.

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Source	Pathway	Human Receptors		Ecological receptors	
		IMW	Future land users (commercial / industrial and recreational)	Onsite fauna and flora	Aquatic ecosystem of Windermere Bay
	Direct contact (inc. ingestion) with contaminated materials and/or soil	All reported concentrations of CoPC were below adopted human health criteria. While BDR was not often present within the fill layers, two parallel concrete structures were observed southwest of the Site, and concrete rubble was often seen at surface, suggesting buried infrastructure could still be present at specific locations. This poses both an aesthetic risk and a risk of residual contamination associated with these structures. The CEMP should include measures for dealing with unexpected finds during excavations, including potentially buried infrastructure and the associated aesthetic and contaminations risks.	All reported concentrations of CoPC were below adopted human health criteria. While BDR was not often present within the fill layers, two parallel concrete structures were observed at the southwest of the Site, and concrete rubble was often seen at surface, suggesting buried infrastructure could still be present at specific locations. This poses both an aesthetic risk and a risk of residual contamination associated with these structures, albeit unlikely. The CEMP should include measures for dealing with unexpected finds during excavations, including potentially buried infrastructure and the associated aesthetic and contaminations risks.	Some samples reported concentrations of metals and metalloids, most commonly nickel and zinc, above the site-specific EILs (ACLs). Given the absence of potential sources, metals concentrations are considered to be naturally occurring. Considering vegetation will be removed from the Site and it appears from the proposed design that most of the ground surface will be sealed for the Project, no unacceptable risks to fauna or flora are expected from the direct contact pathway. Furthermore, the exceedances are for the ACLs without background concentration added, so the criteria are very conservative.	Pathway not relevant for this receptor.

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Plant uptake and ingestion by onsite fauna	Pathway not relevant for this receptor.	Pathway not relevant for this receptor.	Some samples reported concentrations of metals and metalloids above the calculated site-specific EILs (ACLs). While ecological receptors onsite are limited, offsite fauna and flora could still be exposed metal concentrations in soils. However, apart from discrete slightly more elevated results (CABH02 along the walking track and CATR02 south of the Site), all other exceedances were only marginally above the EILs, with statistics for the dataset showing the 95% UCL below the nominated criteria for all metals except nickel. It is worth noting the calculated site-specific EIL for nickel returned very stringent criteria for both the public open space and commercial / industrial land use scenarios, and these criteria are still considered to be conservative, as they are ACLs and have not been added to a background concentration (as non was established for the Site) Overall, no unacceptable level of risk is expected from the metal and metalloid results, as no widespread contamination has been identified and the limited higher concentrations were isolated and may represent the alternating bedrock which	Pathway not relevant for this receptor.

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Source	Pathway	Human Receptors		Ecological receptors	
		IMW	Future land users (commercial / industrial and recreational)	Onsite fauna and flora	Aquatic ecosystem of Windermere Bay
				includes basalt which is typically high in nickel.	
	Migration of contaminants offsite to the aquatic ecosystem	Pathway not relevant for this receptor.	Pathway not relevant for this receptor.	Pathway not relevant for this receptor.	Sulfur has been reported in shallow soils at concentrations higher than the expected range for natural occurrence in soils. This could be related to the origin of the fill. Effective runoff and sediment controls should be put in place during the construction stage to mitigate the risks from potential residual contamination in Site soils. All other CoPC concentrations were generally below LORs, except for metals and some trace hydrocarbons (typically heavy fractions). Therefore, it is unlikely that any CoPC would migrate offsite in sufficient concentrations to impact the aquatic ecosystem.

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8.1 Data gaps

The main data gaps identified in this ESA include:

- Unknown origin of fill materials onsite
- Potential presence of residual buried infrastructure/features onsite – the area around the concrete rubble and two parallel concrete features onsite has not been investigated; and
- Ballast leachability testing is not NATA accredited – ballast could not be crushed into small enough fractions to meet to the accredited extraction procedure. However, analyses of ballast samples were additional and meant as a screening tool for identifying potential impact on ballast, so this data gap does not affect the results of this ESA.

8.2 Risk evaluation

Based on the SPR linkage assessment in Section 8, SPR linkages were observed to either be incomplete or low risk, with any residual low risks associated only with the construction phase, to be managed via a CEMP.

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9. Conclusions and recommendations

9.1 Conclusions

Based on the findings of this ESA and noting the Limitations (Section 1.5) and identified data gaps (Section 8.1):

- Fill material has been confirmed to be present throughout the Site and also adjacent to the Site within the landfill area that was formed into a levelled terrace south of the Site, and to the west, along the walkway within the historic railway alignment. The fill material consists mostly of mixed sand and gravel with some reworked natural soils, and extends to varying depths across the Site. BDR and sundry wastes were occasionally present. Furthermore, only SMF have been positively identified within some samples, with no asbestos fibres detected. While BDR was not often present within the fill layers, two parallel concrete structures were observed southwest of the Site, and concrete rubble was often seen at surface, suggesting buried infrastructure could still be present in some locations, which would pose aesthetic and structural risks for the Project
- Screening assessment completed in the shallow layers of the soil profile indicates that no significant impact has occurred from particulate fallout from the Cadbury factory, given no detectable concentrations of dioxins and furans were reported, and nitrogen oxides concentrations were reported within the expected range for natural soils. Sulfur oxides concentrations above the expected range for natural soils is likely related to the origin of the fill material onsite
- While the finding of ballast within location CABH02 suggests that residual materials may still be present within the former railway alignment, reported contaminant concentrations in soils and the leachability testing in the ballast sample suggest that it is unlikely that residual impacts from the historic railway would be present at unacceptable levels within the Site or at the proposed start the new access tracks to the proposed jetty
- The **preliminary**, insitu, waste classification suggests that the materials onsite would be predominantly classified as *Level 1 – fill material* in accordance with IB105, except for the southern portion of the Site where *Level 2 – low-level contaminated soils* were found to occur in certain layers of the fill profile. Furthermore, the terraced landfill area to the south of the Site and shallow layers of the profile along the walking track leading to the Site, are also classified indicatively as *Level 2 – low-level contaminated soils*. Figure 3 within Appendix A shows the indicative boundary of the preliminary waste classification completed, and waste soils management measures are recommended in Section 9.2
- Soils and fill material from the investigation areas are considered suitable for onsite reuse from both human health and ecological perspectives provided the recommendations for waste management in Section 9.2 are implemented, especially around the limitations for reuse of materials from areas with level 2 waste and areas where exceedances of the ecological criteria were reported; and
- Overall, no unacceptable level of risk to any receptors was identified from on- and off-site sources of potential contamination as the source-pathway-receptor linkages were either incomplete or low risk.

NOTE: The figures within Appendix A shows the Site investigation area in red line, while the updated footprint, provided on 28/8/2025, is shown in blue line. The updated footprint extends outside of the Site investigation for this ESA, however the contamination risk in areas to the north and east, beyond the Site investigation boundary, and within the blue line, is deemed to be similar to the areas investigated via test pitting in the north of the Site and via trenching in the south-east of the Site. As such, the recommendations made initially for the investigated Site area, apply just as well to the extended footprint, shown in blue line.

Suitability statement – Potentially Contaminated Land Code

This ESA demonstrates that the Site is suitable for the proposed development with regards to the PCLC of the Planning Scheme given: no unacceptable level of risk has been identified; and the recommendations in Section 9.2 satisfy the performance criteria P1(c) of the development standards C14.6.1 of the PCLC.

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9.2 Recommendations

Based on the findings of this ESA, the following recommendations are made:

- A CEMP will need to be developed for the construction stage of the Project and should include (and not be limited to) the following:
  - Effective dust control measures to limit exposure of workers to SMF potentially present within the Site soils and/or fill materials
  - Effective soil containment and erosion management and prevention, due to the nearby Derwent Estuary
  - Measures for dealing with unexpected potentially contaminated finds, and potentially buried infrastructure/features given the observations of concrete rubble at surface and two parallel concrete features southwest of the Site. These measures may need to include the removal of these concrete members to remove any aesthetic concern, and measures for dealing with any contamination potentially associated with them, which may include the engagement of a site contamination specialist
  - Waste management measures for **onsite reuse** of excavated materials:
    - Do not reuse soils with stains or odours
    - Complete separation and segregation of solid wastes, including BDR, from soils prior to onsite reuse to prevent aesthetic risks
    - Soils and fill from areas where level 2 wastes and/or exceedances of ecological criteria were reported (refer Figure 3 within Appendix A) should be reused either within the building footprint, beneath paving, or covered with topsoils if reused in planted areas
  - Waste management measures for **offsite disposal** of excavated materials:
    - Where practicable, segregation of the excavated materials/soils should be carried out based on the results of the preliminary waste classification in this ESA (refer Figure 3 within Appendix A) to minimise the costs associated with waste disposal
    - Sampling and analysis of excavated waste soils for waste classification in accordance with IB105 to be completed prior to offsite disposal; and
    - Offsite disposal of any excavated material/soil classified as Level 2 or above (under IB105) requires pre-approval from the EPA under a Regulation 21 application.

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10. References

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The opinions, conclusions and any recommendations in the Report are based on information obtained from laboratories and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of the Report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in the Report. Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of the Report.

The opinions, conclusions and any recommendations in the Report are based on conditions encountered and information reviewed at the date of the site visit. pitt&sherry has no responsibility or obligation to update the Report to account for events or changes occurring subsequent to the date that the site visit was carried out.

pitt&sherry does not accept responsibility arising from, or in connection with, any change to the site conditions. pitt&sherry is also not responsible for updating the Report if the site conditions change.

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Figures

Appendix A

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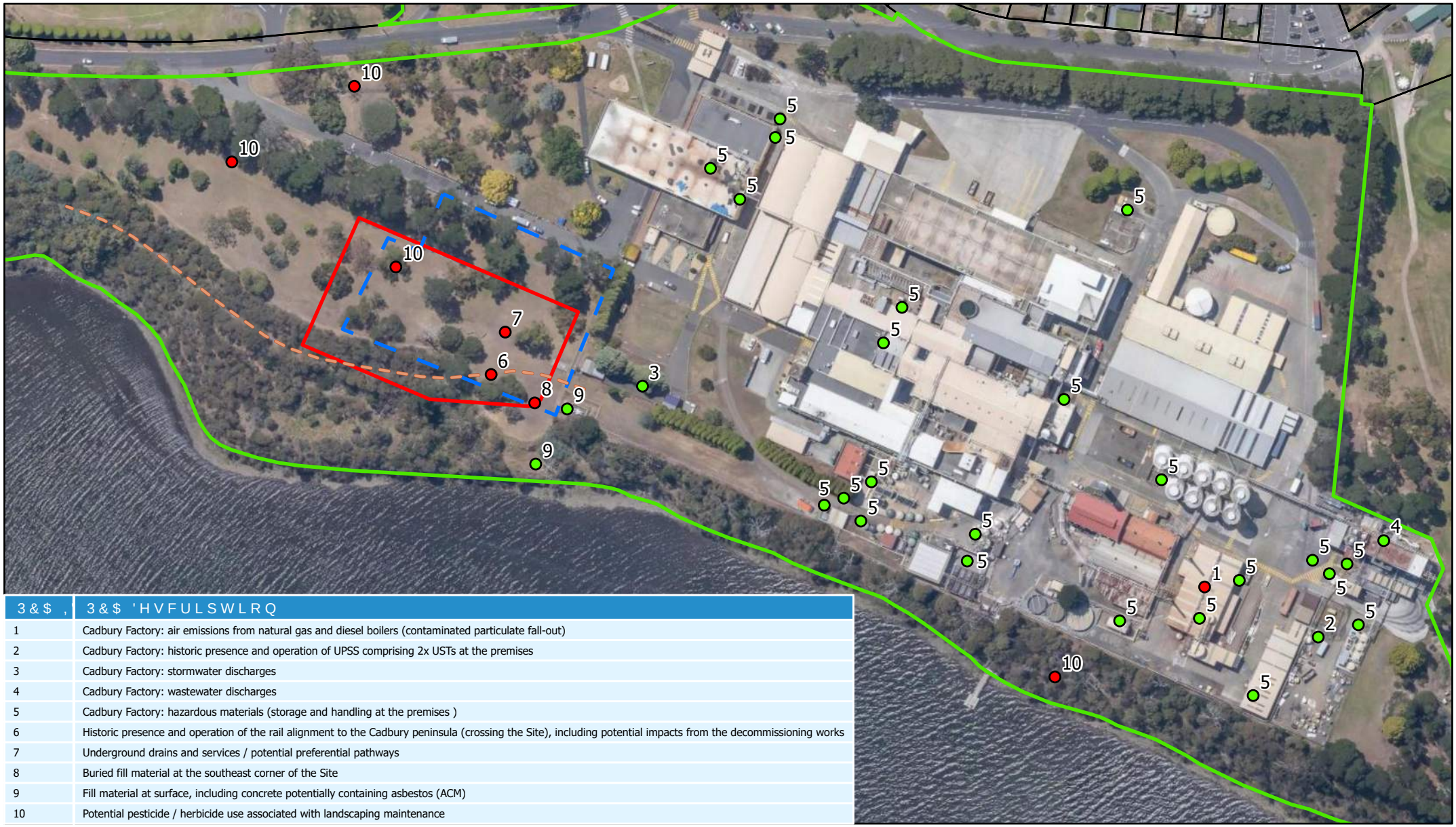
Bass Strait

Tasmania

Hobart

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3URSHUW\ %RXQGDU\
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6RLOV WR WKH VRXWK RI WKH \HOORZ OLQH DUH SRWHQWLDOO\ /HYHO ZDVWH VRLOV ,% DQG ZRXOG UHTXLUH UH FODVVLILFDWLRQ SULRU WR RIIVLWH GLVSRVDO

Bass Strait
Tasmania
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Field sheets

Appendix B

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SOIL SAMPLING FIELD DATA SHEET

Project number:	P.23.1303
Project name:	Cadbury ESA

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Site I.D	**Cadbury ESA**
Date	**7/7/25 - 8/7/25**
Completed by	**KR**

Location ID	Depth (m)	Date & Time	Coordinates	Material type (soil, loam, clay, silt, gravel, fill, etc.)	Moisture (D, M, W)	Texture (C, M, F)	Colour	PID (ppm)	Odour (yes/no and type)	Staining (yes/no and type)	Sampled? (ID)	Comments - e.g. more detailed descriptions, location, etc.
CABH01	0.0-0.1	7/07/2025	521583.2064, 5262151.9485	Loamy sand	D	C	Dark brown	0	Earthy	N	N	Surface layer slightly darker than sub surface layer; high fine sand content with root substructure
CABH01	0.1-0.5	7/07/2025	521583.2064, 5262151.9485	Loamy sand	D	C	Light brown	0	Earthy	N	CABH01/0.3	Lighter brown with high medium to fine sand content; some subangular and rounded gravel and – cobbles encountered; refusal not encountered beyond 0.5 m
CABH02	0.0-0.1	7/07/2025	521533.2556, 5262187.7527	Loamy sand	D	C	Dark brown	1.5	Earthy	N	N	Surface layer slightly darker than sub surface layer; high fine sand content with root substructure; earthy odour; ballast (dolerite) evidence at and below surface
CABH02	0.1-0.4	7/07/2025	521533.2556, 5262187.7527	Sandy loam	D	M-f	Light brown	3.8	Earthy	N	CABH02/0.3	High PID reading recorded; earthy odour; higher silt/clay content evident than BH01; occasional larger gravel near top; thin layer of fine angular gravel observed (capping?)
CABH02	0.4-0.5	7/07/2025	521533.2556, 5262187.7527	Sandy clay	D	M	Light brown/dark yellow	0.4	Earthy	N	CABH02/0.4	Clay layer lighter again with models of white or cream and dark yellows; earthy odour densely packed material extracted mostly as clumps; apparent refusal at 0.5 m
Rinsate		7/07/2025	521687.2096, 5262130.8895								QCR-01	Rinsate of hand auger
CATP01	0.0-0.2	8/07/2025	521672.0662, 5262141.6857	Fcr and sandy loam	M	M	Dark brown	0	Earthy	N	CATP01/0.1	Surface layer Sandy loam with mostly round gravel and very limited BDR (broken cup fragment);
CATP01	0.2-0.5	8/07/2025	521672.0662, 5262141.6857	Clayey sand with gravel	M	C	Brown	0	Earthy	N	CATP01/0.3	Rounded gravel of varying sizes and base material present; the inconsistency of gravels is noted;
CATP01	0.5-0.8	8/07/2025	521672.0662, 5262141.6857	Thick clay with gravel	M	F	Mottled orange and grey	0	N	N	CATP01/0.4	Likely start of natural ground; highly cohesive clay with some gravel; 50-50 mottled on surface of clods of orange and grey and some red streaks; highly cohesive clay extracted; refusal on rock at 0.7 m
QCP01	0.2-0.5	8/07/2025	521687.2096, 5262130.8895	Coarse sand with gravel	M	C	Light brown	0	Earthy	N	CATP06/0.3 QCP-01; QCS-01	Predominantly core sand moist with some clay; less than 30% gravel approximately 1 cm average sub angular to rounded; ASCNEPM sampled
QCS01	0.2-0.5	8/07/2025	521687.2096, 5262130.8895	Coarse sand with gravel	M	C	Light brown	0	Earthy	N	CATP06/0.3 QCP-01; QCS-01	Predominantly core sand moist with some clay; less than 30% gravel approximately 1 cm average sub angular to rounded; ASCNEPM sampled
CATP02	0.0-0.2	8/07/2025	521646.7684, 5262155.7585	Loamy sand	D	M	Dark brown	0	Earthy	N	CATP02/0.1	Silty sand with rounded gravel
CATP02	0.2-0.6	8/07/2025	521646.7684, 5262155.7585	Silty sand	D	M	Light brown	0	Earthy	N	CATP02/0.4; QC-02	Medium to fine sand with silt and mostly rounded gravel less than 2 cm in size; ASCNEPM/asbestos bags taken
CATP02	0.6-1.2	8/07/2025	521646.7684, 5262155.7585	Clayey sand with gravel	D	C	Orange	0	Earthy	N	CATP02/0.8	Course RG yellow sands similar to lower profiles at other holes; note that no substantial clay layout present above course Sandy layer (some clay evident)
CATP03	0.0-0.5	8/07/2025	521632.0249, 5262143.2489	Loamy sand	D	M	Light brown	0	Earthy	N	CATP03/	Loamy sand, fine sand, with rounded gravel; light brown to pale brown; slight earthy odour; similar to top profiles encountered at BH01 and BH02
CATP03	0.5-1.2	8/07/2025	521632.0249, 5262143.2489	Silty sand with clay	M	C	Mottled orange and grey	0	Earthy	N	CATP03/0.7	Mottled orange and pale grey similar to equivalent profiles on site but with obviously higher sand content and smaller clumps of clay; occasional red streaks in mottle; refusal encountered on rock near beginning of clay at Southern end of pit
CATP04	0.0-0.3	8/07/2025	521619.5492, 5262158.5372	Loamy sand with gravel	D	M	Grey	0	Earthy	N	CATP04/0.2	Rounded gravel of differing composition (approximately 20%) heavily root bounds layer
CATP04	0.3-0.6	8/07/2025	521619.5492, 5262158.5372	Gravelly sand	D	M	Light brown	0	Earthy	N	CATP04/0.4	Send with higher composition of gravel of varying base material, shape and roundness;
CATP04	0.6-1.4	8/07/2025	521619.5492, 5262158.5372	Clay with sand	M	F	Mottled orange and grey	0	Earthy	N	CATP04/0.7	Similar clay profile with Familiar Mottle; high consistency clay; some red streaking evident in mottle; at lower depths highly weathered/soft sandstone evident along with course orange sand;
CATP05	0.0-0.2	8/07/2025	521629.3993, 5262191.5237	Loamy sand with gravel	D	M	Grey	0	Earthy	N	CATP05/0.1	Rounded gravel of differing composition (approximately 20%) heavily root bounds layer
CATP05	0.2-0.6	8/07/2025	521629.3993, 5262191.5237	Gravelly sand with clay	D	M	Light brown	0	Earthy	N	CATP05/0.4	Sand with some clay and gravel of varying base material, shape and roundness

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CATP05	0.6-1.1	8/07/2025	521629.3993, 5262191.5237	Thick clay with gravel	M	F	Mottled orange and grey	0	Earthy	N	CATP05/0.8	Highly cohesive clay with some rounded gravel; 50-50 mottled on surface of clods of orange and grey and some red streaks; highly cohesive clay extracted; refusal on rock at 0.7 m
CATP05	1.1-1.2	8/07/2025	521629.3993, 5262191.5237	Clayey sand with rounded gravel	D	M	Mottled orange and grey	0	Earthy	N	N	Slightly similar to previous layer albeit with finer clumps of clay and additional white modelling in parts clay nearing rock status in terms of compression but is dry and brittle
QCP02	0.2-0.6	8/07/2025	521687.2096, 5262130.8895	Silty sand	D	M	Light brown	0	Earthy	N	CATP02/0.4; QC-02	Medium to find sand with silt and mostly rounded gravel less than 2 cm in size; ASCNEPM/asbestos bags taken
QCS02	0.2-0.6	8/07/2025	521687.2096, 5262130.8895	Silty sand	D	M	Light brown	0	Earthy	N	CATP02/0.4; QC-02	Medium to find sand with silt and mostly rounded gravel less than 2 cm in size; ASCNEPM/asbestos bags taken
CATP06	0.0-0.2	8/07/2025	521681.5153, 5262169.1228	Sandy loam	D-m	C	Dark brown	0	Earthy	N	CATP06/0.1	High composition of gritty sand, dark brown colour with medium size gravel; no odour
CATP06	0.2-0.5	8/07/2025	521681.5153, 5262169.1228	Coarse sand with gravel	M	C	Light brown	0	Earthy	N	CATP06/0.3 QCP-01; QCS-01	Predominantly coarse sand moist with some clay; less than 30% gravel approximately 1 cm average sub angular to rounded; asbestos and ASCNEPM sampled
CATP06	0.5-0.8	8/07/2025	521681.5153, 5262169.1228	Thick clay with gravel	M	F	Mottled orange and grey	0	N	N	CATP06/0.5	Potential start of natural ground; highly cohesive clay with some gravel; 50-50 mottled on surface of clods of orange and grey and some red streaks
CATP06	0.8-1.2	8/07/2025	521681.5153, 5262169.1228	Coarse sand with clay	M	C	Orange	0	N	N	CATP0.6/0.7	Mainly corse sand with gravel and cobbles of highly weathered sand or siltstone
CATR01-F	0.0-0.2	8/07/2025	521697.561, 5262136.291	Loamy sand with gravel	D	M	Dark brown	0	N	N	CATR01-F/0.1	Loamy sand with rounded gravel
CATR01-F	0.2-0.8	8/07/2025	521697.561, 5262136.291	Clayey sand with gravel	D	M	Lighter brown with reddish streaks	0	Earthy	N	CATR01-F/0.5	Obvious fill layer with larger concrete chunks present
CATR01-F	0.8-1.8	8/07/2025	521697.561, 5262136.291	Sand with gravel	D	M	Lighter grey and coal ash	0	Earthy	N	CATR01-F/1.2	Layer has black steak like a layer of coal/coal ash mixed with fill; plastic rubbish evident near base of layer
CATR01-F	1.8-2.0	8/07/2025	521697.561, 5262136.291	Sand with gravel	D	M-f	Grey-brown	0	Earthy	N	CATR01-F/1.9	Decomposing timber and plastic rubbish evident; similar in texture to previous layer;
CATR01-F	2.0-2.8	8/07/2025	521697.561, 5262136.291	Gravelly sand with clay	D	M	Brown with some yellow	0	Earthy	N	CATR01-F/2.4	Increasing clay composition with larger gravel, potentially ballast material?
CATR01-F	2.8-3.2	8/07/2025	521697.561, 5262136.291	Clayey sand	M	M	Brown with orange-yellow	0	Earthy	N	CATR01-F/3.0	Likely beginning of more natural layer/clay; clay more cohesive; gravel of varying roundest and composition
CATR01-C	0.0-0.4	8/07/2025	521697.561, 5262136.291	Gravelly sand	D	C	Light brown with reddish streaks	0	Earthy	N	CATR01-C/0.2	Loamy sand with rounded gravel
CATR01-C	0.4-0.7	8/07/2025	521697.561, 5262136.291	Gravelly sand	D	C	Dark brown	0	Earthy	N	CATR01-C/0.5	Thin layer of black material at top of layer some larger gravel is and cobbles very materials; some bitchumen
CATR01-C	0.7-1.0	8/07/2025	521697.561, 5262136.291	Silty sand with clay and gravel	D	F	Cream- white	0	Earthy	N	CATR01-C/0.9	High composition of rounded pebbles intrusions between layer below and this edge
CATR01-C	1.0-1.2	8/07/2025	521697.561, 5262136.291	Clayey sand	M	M	Brown with orange-yellow	0	Earthy	N	CATR01-C/3.0	Likely beginning of more natural layer/clay; clay more cohesive; gravel of varying roundness and composition
CATR01-D	0.0-0.4	8/07/2025	521697.561, 5262136.291	Gravelly sand	D	C	Light brown with reddish streaks	0	Earthy	N	N	Loamy sand with rounded gravel
CATR01-D	0.4-0.7	8/07/2025	521697.561, 5262136.291	Gravelly sand	D	C	Grey	0	Earthy	N	N	High composition of rounded pebbles intrusions between layer below and this edge
CATR01-D	0.7-1.0	8/07/2025	521697.561, 5262136.291	Silty sand with clay and gravel	D	F	Cream- white	0	Earthy	N	N	Likely beginning of more natural layer/clay; clay more cohesive; gravel of varying roundness and composition
CATR01-D	1.0-1.2	8/07/2025	521697.561, 5262136.291	Clayey sand	M	M	Brown with orange-yellow	0	Earthy	N	N	Likely beginning of more natural layer/clay; clay more cohesive; gravel of varying roundness and composition
CATR01-A	0.0-0.2	8/07/2025	521697.561, 5262136.291	Sandy loam	M	M	Dark brown	0	Earthy	N	CATR01-A/0.1	Surface layer Sandy loam with mostly round gravel and very limited BDR (broken cup fragment);
CATR01-A	0.2-0.5	8/07/2025	521697.561, 5262136.291	Clayey sand with gravel	M	C	Pale Brown	0	Earthy	N	CATR01-A/0.3	Rounded gravel of varying sizes and base material present; the inconsistency of gravels is noted;
CATR01-A	0.5-1.7	8/07/2025	521697.561, 5262136.291	Thick clay with gravel	M	F	Mottled orange and grey	0	Earthy	N	N	Likely start of natural ground; highly cohesive clay with some gravel; 50-50 mottled on surface of clods of orange and grey and some red streaks; highly cohesive clay extracted; refusal on rock at 1.7 m
CATR02	0.0-0.2	8/07/2025	521687.2096, 5262130.8895	Sandy loam	D	M	Brown	0	Earthy	N	CATR02/0.2	Some concrete boulders/cobbles evident near surface
CATR02	0.4-0.8	8/07/2025	521687.2096, 5262130.8895	Sandy loam	M	F	Light brown	0	Earthy	N	CATR02/0.5	Some concrete boulders/cobbles evident near surface
CATR02	0.8-0.9	8/07/2025	521687.2096, 5262130.8895	Silty sand	D	F	Pale grey	0	Earthy	N	CATR02/0.9	Gravelly bitumen observed
CATR02	0.9-1.0	8/07/2025	521687.2096, 5262130.8895	Gravelly sand	D	F	brouny-yellow	0	Earthy	N	N	Hard sandstone; failure on rock past 1 m bgl

Photographic report

Appendix C

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SOIL SAMPLING

PHOTOGRAPHIC RECORD

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Project I.D	**P.23.1303**
Site I.D	**Cadbury ESA**
Date	**7/7/25 - 8/7/25**
Completed by	**KR**
Weather	**Fine**

Image	Location	Depth	Comment
	CABH01	0	General walkover image, showing raised embankment along southern side of walking track (near CABH01)
	CABH01	0	General walkover image, showing raised embankment along southern side of walking track (near CABH01)

Image	Location	Depth	Comment
	CABH01	0	General walkover image, showing exposed cutting through embankment along old rail corridor; the top horizon appears to be about 0.5 m and looks like silty, Lomie Clay with rounded gravel
	CABH01	0	Context image, facing east along track
	CABH01	0	Showing soil profile of BH01

Image	Location	Depth	Comment
	CABH01	0.1-0.5	Soil samples taken from borehole
	CABH02	0	Context shot, facing east along old railway track
	CABH02	0	Showing depth and profile of borehole

Image	Location	Depth	Comment
	CABH02	0.4-0.5	Showing extracted soil profiles and samples taken from clay layer
	CATP06	0	Showing depth and profile of test pit
	CATP01	0	General walkover image, showing exposed concrete structures at or near site boundaries

Image	Location	Depth	Comment
	CATP01	0	General walk over image; concrete rubble visible at surface near TP01
	CATP01	0	Showing depth and profile of test pit
	CATP01	0	Showing depth and profile of test pit

Image	Location	Depth	Comment
	CATP01	0.0-0.2	Excavated profile close up
	CATP01	0.2-0.5	Excavated profile close up
	CATP01	0.5-0.8	Excavated profile close up

Image	Location	Depth	Comment
	CATP02	0	Showing depth and profile of test pit
	CATP02	0	Showing depth and profile of test pit
	CATP02	0.0-0.2	Excavated profile close up

Image	Location	Depth	Comment
	CATP02	0.2-0.6	Excavated profile close up
	CATP02	0.6-1.2	Excavated profile close up
	CATP03	0	Showing reddish streak within predominantly modelled orange and grey

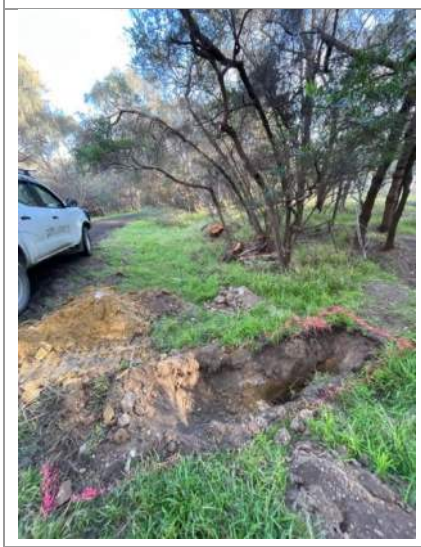
Image	Location	Depth	Comment
	CATP03	0	Showing depth and profile of test pit
	CATP03	0	Showing depth and profile of test pit
	CATP03	0.0-0.5	Excavated profile close up

Image	Location	Depth	Comment
	CATP03	0.5-1.2	Excavated profile close up
	CATP04	0	Showing depth and profile of test pit
	CATP04	0	Showing depth and profile of test pit

Image	Location	Depth	Comment
	CATP04	0.0-0.3	Excavated profile close up
	CATP04	0.3-0.6	Excavated profile close up
	CATP04	0.6-1.4	Excavated profile close up

Image	Location	Depth	Comment
	CATP05	0	Showing depth and profile of test pit
	CATP05	0.0-0.2	Excavated profile close up
	CATP05	0.2-0.6	Excavated profile close up

Image	Location	Depth	Comment
	CATP05	0.6-1.1	Excavated profile close up
	CATP05	1.1-1.2	Excavated profile close up
	CATP06	0	Showing depth and profile of test pit

Image	Location	Depth	Comment
	CATP06	0.0-0.2	Excavated profile close up
	CATP06	0.2-0.5	Excavated profile close up
	CATP06	0.5-0.8	Excavated profile close up

Image	Location	Depth	Comment
	CATP06	0.8-1.2	Excavated profile close up
	CATR01-A	0	Showing excavated profile and depth of CATR01-A
	CATR01-A	0	Showing excavated profile and depth of CATR01-A

Image	Location	Depth	Comment
	CATR01-A	0	Showing excavated profile and depth of CATR01-A
	CATR01-A	0	Showing overview of excavated profiles as sampled
	CATR01-A	0.0-0.5	Excavated profile close up

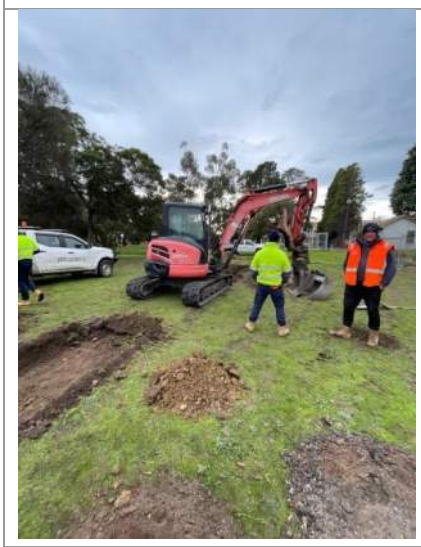
Image	Location	Depth	Comment
	CATR01-A	0.5-1.7	Excavated profile close up
	CATR01-C	0	Context - showing excavation of CATR01-C
	CATR01-C	0	Showing excavated profile

Image	Location	Depth	Comment
	CATR01-C	0	Context - excavated profile (CATR01-C and CATR01-D)
	CATR01-C	0	Context - excavated profile (CATR01-C and CATR01-D)
	CATR01-C	0	Context - excavated profile (CATR01-C and CATR01-D)

Image	Location	Depth	Comment
	CATR01-C	0	Excavated profile close up
	CATR01-C	0.0-0.4	Excavated profile close up
	CATR01-C	0.4-0.7	Excavated profile close up

Image	Location	Depth	Comment
	CATR01-C	0.7-1.0	Excavated profile close up
	CATR01-C	1.0-1.2	Excavated profile close up
	CATR01-D	0.0-0.4	Excavated profile close up

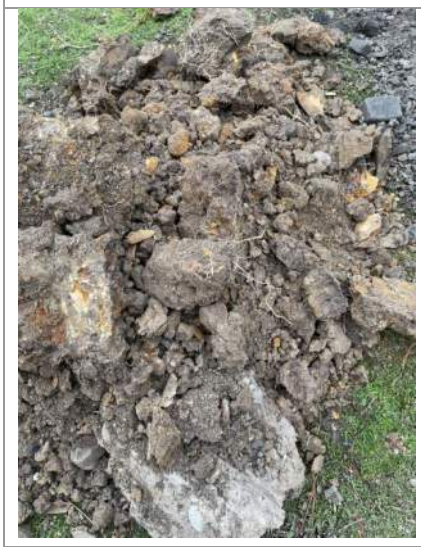
Image	Location	Depth	Comment
	CATR01-D	0.4-0.7	Excavated profile close up
	CATR01-D	0.7-1.0	Excavated profile close up
	CATR01-D	1.0-1.2	Excavated profile close up

Image	Location	Depth	Comment
	CATR01-F	0	Showing depth and profile of borehole
	CATR01-F	0	Excavation profile
	CATR01-F	0	Excavation context

Image	Location	Depth	Comment
	CATR01-F	0	Showing depth and profile of CATR01-F
	CATR01-F	0	Excavated profile close up
	CATR01-F	0	Excavated profile close up

Image	Location	Depth	Comment
	CATR01-F	0	Excavated profile close up
	CATR01-F	0.0-0.2	Excavated profile close up
	CATR01-F	0.2-0.8	Excavated profile close up

Image	Location	Depth	Comment
	CATR01-F	0.8-1.8	Excavated profile close up
	CATR01-F	1.8-2.0	Excavated profile close up
	CATR01-F	2.0-2.8	Excavated profile close up

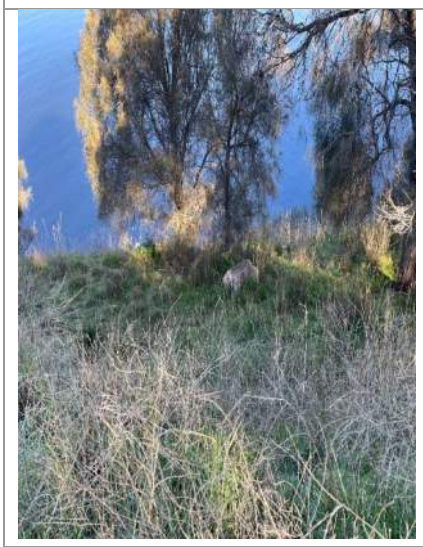
Image	Location	Depth	Comment
	CATR01-F	2.8-3.2	Excavated profile close up
	CATR02	0	BDR evident near ravine face
	CATR02	0	Large chunk of concrete exposed at surface around CATR02

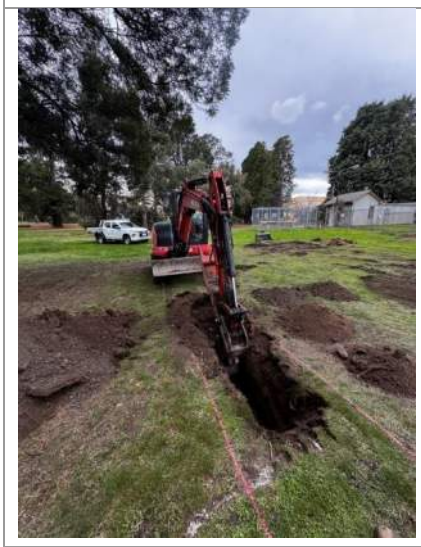
Image	Location	Depth	Comment
	CATR02	0	General walkover image; unevenness of surface around trench one and trench to suggests relatively recent alteration of natural surface
	CATR02	0	Showing excavated profile and depth of CATR02
	CATR02	0	Showing excavation of CATR02

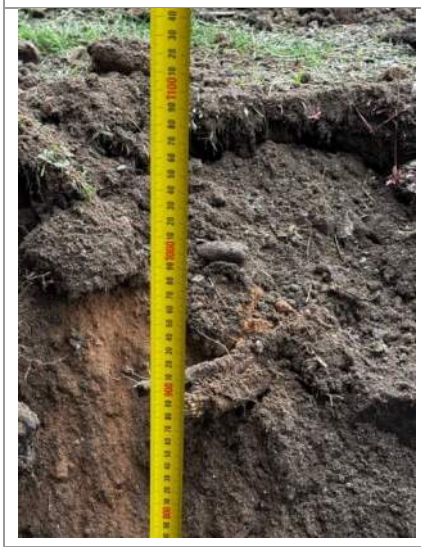
Image	Location	Depth	Comment
	CATR02	0	Showing BDR (concrete boulders) extracted near surface
	CATR02	0	Refusal on rock at 1 m bgl
	CATR02	0	Profile close up

Image	Location	Depth	Comment
	CATR02	0	Profile close up
	CATR02	0	Profile close up
	CATR02	0	Profile close up

Image	Location	Depth	Comment
	CATR02	0	Showing plastic from excavated fill layer
	CATR02	0	Showing excavated profiles as sampled (0.0-0.8 m bgl)
	CATR02	0	Showing excavated profiles as sampled (0.0-0.8 m bgl)

Image	Location	Depth	Comment
	CATR02	0	Rock fragment from refusal profile at 1.0 m bgl
	CATR02	0.0-0.8	Showing excavated profiles as sampled (0.0-0.8 m bgl)
	CATR02	0.8-1.0	Showing excavated profiles as sampled (0.8-1.0 m bgl)

Image	Location	Depth	Comment
	CATR02	0.8-1.0	Showing excavated profiles as sampled (0.8-1.0 m bgl)

Summary results tables

Appendix D

pitt&sherry

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

SUMMARY RESULTS - SOIL / FILL MATERIAL

Project No: P.23.1303
Project Name: Cadburry Visitor Experience Development ESA

| Analyte Grouping | | | | | Total Heavy Metals | | | | | | | | | | | | | | | Leachable Metals (TCLP) | | | | | | | | | | | | | | | | | | Total Recoverable Hydrocarbons (TRH) | | | | | | BTEXN | | | | | Leachable BTEXN | | | | Polycyclic Aromatic Hydrocarbons (PAH) | | | Leachable PAH | | Phenoxyacetic Acid Herbicides | | | | | | | Asbestos and Other Fibres | | |
|---|---|---

SUMMARY RESULTS - TRIPLICATES (SOIL)

Project No: P.23.1303
Project Name: Cadburry Visitor Experience Development ESA

			Analyte Group	Heavy Metals								TPH					TRH					BTEXN					PAH			Asbestos and Fibre		
			Analyte	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc	Mercury (total)	C6-C9	C10-C14	C15-C28	C29-C36	Sum (C10-C36)	C6-C10 minus BTEX (F1)	>C10-C16 minus Naphthalene (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Sum (>C10-C40)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Naphthalene	Benzo[a]pyrene	Carcinogenic PAHs (as BaP TEQ)	Total PAHs	Asbestos (presence / absence)	Synthetic Mineral Fibre (presence / absence)	Organic Fibre (presence / absence)
			ALS LORs	5	1	2	5	5	2	5	0.1	10	50	100	100	50	10	50	100	100	50	0.2	0.5	0.5	0.5	1	0.5	0.5	0.5	0.1	-	-
Sample ID	**Date sampled**	**Laboratory**	**Units**	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	mg/kg	g/kg	-	-
Test pit triplicate 1																																
CATP06/0.3	18-Jun-25	ALS		<5	<1	6	<5	<5	<2	5	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	No	No	No
QCP01	18-Jun-25	ALS		<5	<1	5	<5	<5	<2	7	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	----	----	----
RPD				ND	ND	18	ND	ND	ND	33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CATP06/0.3	18-Jun-25	ALS		<5	<1	6	<5	<5	<2	5	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	No	No	No
QCS01	18-Jun-25	Eurofins		3.3	< 0.4	9.6	< 5	< 5	< 5	< 5	< 0.1	< 20	< 20	< 50	< 50	< 50	< 20	< 50	< 100	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5	< 0.5	< 0.5	< 0.5	----	----	----
RPD				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
QCP01	18-Jun-25	ALS		<5	<1	5	<5	<5	<2	7	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	----	----	----
QCS01	18-Jun-25	Eurofins		3.3	< 0.4	9.6	< 5	< 5	< 5	< 5	< 0.1	< 20	< 20	< 50	< 50	< 50	< 20	< 50	< 100	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5	< 0.5	< 0.5	< 0.5	----	----	----
RPD				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Test pit triplicate 2																																
CATP02/0.4	18-Jun-25	ALS		<5	<1	3	<5	6	<2	21	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	No	No	No
QCP02	18-Jun-25	Eurofins		<5	<1	2	<5	10	<2	27	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	----	----	----
RPD				ND	ND	40	ND	50	ND	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CATP02/0.4	18-Jun-25	ALS		<5	<1	3	<5	6	<2	21	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	No	No	No
QCS02	18-Jun-25	ALS		< 2	< 0.4	< 5	< 5	5.6	< 5	17	< 0.1	< 20	< 20	< 50	< 50	< 50	< 20	< 50	< 100	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5	< 0.5	< 0.5	< 0.5	----	----	----
RPD				ND	ND	ND	ND	7	ND	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
QCP02	18-Jun-25	ALS		<5	<1	2	<5	10	<2	27	<0.1	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	----	----	----
QCS02	18-Jun-25	Eurofins		< 2	< 0.4	< 5	< 5	5.6	< 5	17	< 0.1	< 20	< 20	< 50	< 50	< 50	< 20	< 50	< 100	< 100	< 100	< 0.1	< 0.1	< 0.1	< 0.3	< 0.5	< 0.5	< 0.5	< 0.5	----	----	----
RPD				ND	ND	ND	ND	56	ND	45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Legend:

	Passed criteria
	Could not be determined (e.g. not tested for that analyte)
	Failed criteria
--	Not tested
LOR	Limit of reporting
RPD	Relative percentage difference
ND	Not determined as one value is less than LOR or results are less than 2x the LOR (no RPD applicable)

RPD = ((Result1 - Result2) / mean result) * 100

No RPD limit applies where values reported by laboratory are less than two times the LOR
Where values reported by laboratory are less than 20 times the LOR, then the calculated RPD should be less than 50%
Where values reported by laboratory are 20 to 100 times the LOR, then the calculated RPD should be less than 30%
Where values reported by laboratory are greater than 100 times the LOR, then the calculated RPD should be less than 15%

SUMMARY RESULTS - TRIP BLANKS (SOIL)

Project No: P.23.1303
Project Name: Cadburry Visitor Experience ESA

			Analyte Grouping	**Total Petroleum Hydrocarbons (TPH)**					**Total Recoverable Hydrocarbons (TRH)**					**BTEXN**				
			Analyte	C6-C9	C10-C14	C15-C28	C29-C36	Sum (C10-C36)	C6-C10 minus BTEX (F1)	>C10-C16 minus Naphthalene (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Sum (>C10-C40)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Naphthalene
			ALS LORs	10	50	100	100	50	10	50	100	100	50	0.2	0.5	0.5	0.5	1
Sample ID	**Date sampled**	**Laboratory**	**Units**	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
TB-Soil	07-Jul-25	ALS		<10	----	----	----	----	<10	--	--	--	--	<0.2	<0.5	<0.5	<0.5	<1
QA/QC Assessment				P	--	--	--	--	P	--	--	--	--	P	P	P	P	P

Legend:

P	Passed
D	Detected
--	Not tested
Bold	Reported concentration is greater than the laboratory LOR
Grey	Reported concentration is below the LOR
LOR	Limit of reporting

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SUMMARY RESULTS - TRIP BLANK (WATER) & RINSATES

Project No: P.23.1303
Project Name: Cadbury Visitor Experience ESA

			Analyte Grouping	**Total Heavy Metals**								**Total Petroleum Hydrocarbons (TPH)**					**Total Recoverable Hydrocarbons (TRH)**					**BTEXN**					**Polycyclic Aromatic Hydrocarbons (PAH)**		
			Analyte	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Nickel	Zinc	Mercury (total)	C6-C9	C10-C14	C15-C28	C29-C36	Sum (C10-C36)	C6-C10 minus BTEX (F1)	>C10-C16 minus Naphthalene (F2)	>C16-C34 (F3)	>C34-C40 (F4)	Sum (>C10-C40)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Naphthalene	Benzo[a]pyrene	Carcinogenic PAHs (as BaP TEQ (zero))	Total PAHs
			ALS LORs	0.001	0.0001	0.001	0.001	0.001	0.001	0.005	0.0001	20	50	100	50	50	20	100	100	100	100	1	2	2	2	5	0.5	0.5	0.5
Sample ID	**Date sampled**	**Laboratory**	**Units /Description**	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
QC03 (RINSATE)	01-Jul-25	ALS		**0.006**	<0.0001	**0.072**	**0.013**	**0.004**	**0.041**	**0.037**	<0.0001	<20	<50	<100	<50	<50	<20	<100	<100	<100	<100	<1	<2	<2	<2	<5	<0.5	<0.5	<0.5
QA/QC Assessment				D	P	D	P	P	D	D	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Legend:

P	Passed
D	Detected
--	Not tested
Bold	Reported concentration is greater than the LOR
Grey	Reported concentration is below the LOR
LOR	Limit of reporting

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Site Specific EIL Calculations - using ASC NEPM EIL Calculation Spreadsheet

Sample ID	Units	Sample	
		CATP02/0.4	CATP06/0.3
Inputs			
CEC	cmolc/kg	2.4	1.2
pH ($CaCl_2$ method)	pH units	5.6	5.5
Organic Carbon Content	%	0.6	0.25
Iron Content	%	0.341	1.33
Clay Content	%	7	10
State (or nearest State)	--	VIC	Vic
Traffic Volume	--	Low	Low

Outputs - Soil-Specific EILs		Fresh	Aged	Fresh	Aged
Chromium III					
National parks and areas of high conservation value	mg/kg	55	120	75	140
Urban residential and open public spaces	mg/kg	150	360	180	410
Commercial and industrial	mg/kg	240	600	290	670
Copper					
National parks and areas of high conservation value	mg/kg	15	25	15	15
Urban residential and open public spaces	mg/kg	25	55	20	30
Commercial and industrial	mg/kg	35	70	25	40
Nickel					
National parks and areas of high conservation value	mg/kg	3	6	8	5
Urban residential and open public spaces	mg/kg	5	10	9	6
Commercial and industrial	mg/kg	7	15	9	7
Zinc					
National parks and areas of high conservation value	mg/kg	15	65	20	55
Urban residential and open public spaces	mg/kg	50	160	40	110
Commercial and industrial	mg/kg	75	220	55	140

Notes:

Aged values apply to contamination present for at least two years

ACL - Added contaminant limit

CEC - Cation exchange capacity

EIL - Ecological Investigation Level

Most conservative site-specific ACL (aged contamination)

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Laboratory documentation

Appendix E

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CERTIFICATE OF ANALYSIS

Work Order	: **EM2512262**	Page	: 1 of 55
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: Mr Eduardo Pereira Maes	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 0362101400	Telephone	: +61-3-8549 9600
Project	: Cadbury ESA	Date Samples Received	: 09-Jul-2025 10:45
Order number	: P.23.1303	Date Analysis Commenced	: 10-Jul-2025
C-O-C number	: ----	Issue Date	: 22-Jul-2025 14:27
Sampler	: KIERAN RICHARDS		
Site	: ----		
Quote number	: EM25PITSHE0014		
No. of samples received	: 40		
No. of samples analysed	: 39		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Aleksandar Vujkovic	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
MINNIE TRAN	Approved Asbestos Identifier	Melbourne Asbestos, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Satishkumar Trivedi	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP202: Particular samples required dilution due to matrix interferences. LOR values have been adjusted accordingly.
- EP202: Poor matrix spike recoveries for Picloram and Clopyralid due to matrix effects.
- EG048G: EM2512262 #11. Poor insoluble matrix spike recovery for Hexavalent Chromium due to sample matrix interferences. Confirmed by re-analysis.
- EG048G: EM2512262 #11. Sample required dilution prior to Hexavalent Chromium analysis due to sample matrix. LOR value has been adjusted accordingly.
- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP071: Poor duplicate precision observed for sample EM2512256-001. Insufficient sample remains to confirm sample heterogeneity via re-extraction and re-analysis
- Samples logged across two workorders (EM2512262, EM2512276) due to reporting requirements for dioxins and furans.
- ED007 : Potassium for sample EM2512262 #11 and #22 has been detected at less than LOR therefore the Magnesium/Potassium ratio calculation cannot be performed.
- ALS is not NATA accredited for the analysis leachable hydrocarbons or metals in ballast for EM2512262 #3.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2

- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	CABH02/0.3 (Ballast)	----	----	----	----
				Sampling date / time	07-Jul-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2512262-003	--------	--------	--------	--------
					Result	----	----	----	----
EG005(ED093)C: Leachable Metals by ICPAES									
Arsenic	7440-38-2	0.1	mg/L		<0.1	----	----	----	----
Cadmium	7440-43-9	0.05	mg/L		<0.05	----	----	----	----
Chromium	7440-47-3	0.1	mg/L		<0.1	----	----	----	----
Copper	7440-50-8	0.1	mg/L		<0.1	----	----	----	----
Lead	7439-92-1	0.1	mg/L		<0.1	----	----	----	----
Nickel	7440-02-0	0.1	mg/L		<0.1	----	----	----	----
Zinc	7440-66-6	0.1	mg/L		<0.1	----	----	----	----
EG035C: Leachable Mercury by FIMS									
Mercury	7439-97-6	0.0010	mg/L		<0.0010	----	----	----	----
EP071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<50	----	----	----	----
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----

Analytical Results

Sub-Matrix: LEACHATE (Matrix: WATER)				Sample ID	CABH02/0.3 (Ballast)	----	----	----	----
				Sampling date / time	07-Jul-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2512262-003	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L		<0.5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**26.8**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**64.6**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**74.2**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**68.1**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**59.8**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**62.7**	----	----	----	----

Analytical Results

Sub-Matrix: ROCK (Matrix: SOIL)				Sample ID	CABH02/0.3 (Ballast)	----	----	----	----
				Sampling date / time	07-Jul-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2512262-003	--------	--------	--------	--------
					Result	----	----	----	----
EN40: Miscellaneous Leachates Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)									
ø Final pH	----	0.1	pH Unit		**5.0**	**----**	**----**	**----**	**----**
ø Extraction Fluid pH	----	0.1	pH Unit		**5.0**	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CABH01/0.3	CABH02/0.3	CABH02/0.4	TB	CATP01/0.1
			Sampling date / time	07-Jul-2025 00:00	07-Jul-2025 00:00	07-Jul-2025 00:00	07-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-001	EM2512262-002	EM2512262-004	EM2512262-006	EM2512262-007
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	3.0	12.5	22.4	<1.0	8.8
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	No
Asbestos (Trace)	1332-21-4	-	-	----	----	----	----	No
Asbestos Type	1332-21-4	-	--	----	----	----	----	-
Sample weight (dry)	----	0.01	g	----	----	----	----	66.8
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	M. TRAN
Synthetic Mineral Fibre	----	-	--	----	----	----	----	No
Organic Fibre	----	-	--	----	----	----	----	Yes
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	----	----	----	----	0.02
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	22	6	----	<5
Barium	7440-39-3	10	mg/kg	40	80	110	----	10
Beryllium	7440-41-7	1	mg/kg	<1	1	2	----	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	----	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	<1
Chromium	7440-47-3	2	mg/kg	6	74	139	----	4
Cobalt	7440-48-4	2	mg/kg	4	39	74	----	<2
Copper	7440-50-8	5	mg/kg	<5	20	26	----	11
Lead	7439-92-1	5	mg/kg	<5	7	<5	----	18
Manganese	7439-96-5	5	mg/kg	22	49	49	----	31
Nickel	7440-02-0	2	mg/kg	4	66	102	----	<2
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	----	<5
Vanadium	7440-62-2	5	mg/kg	13	71	71	----	18
Zinc	7440-66-6	5	mg/kg	22	69	67	----	82
EG035T: Total Recoverable Mercury by FIMS								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CABH01/0.3	CABH02/0.3	CABH02/0.4	TB	CATP01/0.1
			Sampling date / time	07-Jul-2025 00:00	07-Jul-2025 00:00	07-Jul-2025 00:00	07-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-001	EM2512262-002	EM2512262-004	EM2512262-006	EM2512262-007
				Result	Result	Result	Result	Result
EG035T: Total Recoverable Mercury by FIMS - Continued								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	<0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	----	----	**2.3**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	----	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	----	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CABH01/0.3	CABH02/0.3	CABH02/0.4	TB	CATP01/0.1
				Sampling date / time	07-Jul-2025 00:00	07-Jul-2025 00:00	07-Jul-2025 00:00	07-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-001	EM2512262-002	EM2512262-004	EM2512262-006	EM2512262-007
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	----	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP202A: Phenoxyacetic Acid Herbicides by LCMS									
4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg		<0.02	<0.02	<0.02	----	<0.04
2.4-DB	94-82-6	0.02	mg/kg		<0.02	<0.02	<0.02	----	<0.04
Dicamba	1918-00-9	0.02	mg/kg		<0.02	<0.02	<0.02	----	<0.04
Mecoprop	93-65-2	0.02	mg/kg		<0.02	<0.02	<0.02	----	<0.04
MCPA	94-74-6	0.02	mg/kg		<0.02	<0.02	<0.02	----	<0.04

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CABH01/0.3	CABH02/0.3	CABH02/0.4	TB	CATP01/0.1
			Sampling date / time	07-Jul-2025 00:00	07-Jul-2025 00:00	07-Jul-2025 00:00	07-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-001	EM2512262-002	EM2512262-004	EM2512262-006	EM2512262-007
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
2.4-DP	120-36-5	0.02	mg/kg	<0.02	<0.02	<0.02	----	<0.04
2.4-D	94-75-7	0.02	mg/kg	<0.02	<0.02	<0.02	----	<0.04
Triclopyr	55335-06-3	0.02	mg/kg	<0.02	<0.02	<0.02	----	<0.04
2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.02	<0.02	<0.02	----	<0.04
2.4.5-T	93-76-5	0.02	mg/kg	<0.02	<0.02	<0.02	----	<0.04
MCPB	94-81-5	0.02	mg/kg	<0.02	<0.02	<0.02	----	<0.04
Picloram	1918-02-1	0.02	mg/kg	<0.02	<0.02	<0.02	----	<0.04
Clopyralid	1702-17-6	0.02	mg/kg	<0.02	<0.02	<0.02	----	<0.04
Fluroxypyr	69377-81-7	0.02	mg/kg	<0.02	<0.02	<0.02	----	<0.04
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**83.4**	**81.1**	**79.8**	----	**72.5**
2-Chlorophenol-D4	93951-73-6	0.5	%	**75.5**	**77.0**	**77.5**	----	**71.7**
2.4.6-Tribromophenol	118-79-6	0.5	%	**83.3**	**71.0**	**71.1**	----	**69.6**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**90.5**	**99.0**	**98.0**	----	**91.8**
Anthracene-d10	1719-06-8	0.5	%	**91.6**	**97.6**	**99.2**	----	**94.7**
4-Terphenyl-d14	1718-51-0	0.5	%	**103**	**115**	**113**	----	**108**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**79.6**	**82.8**	**80.7**	**76.4**	**88.0**
Toluene-D8	2037-26-5	0.2	%	**79.7**	**82.0**	**84.2**	**78.0**	**79.1**
4-Bromofluorobenzene	460-00-4	0.2	%	**89.7**	**94.1**	**96.6**	**95.1**	**97.9**
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	**69.3**	**64.4**	**79.4**	----	**83.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP01/0.3	CATP01/0.4	CATP02/0.1	CATP02/0.4	CATP02/0.8
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-008	EM2512262-009	EM2512262-010	EM2512262-011	EM2512262-012
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	----	----	5.1	----
EA002-AD: pH (Soils) dried at 40°C								
pH Value	----	0.1	pH Unit	----	----	----	5.6	----
EA010-AD: Conductivity (Soils) dried at 40°C								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	----	21	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	8.5	20.0	13.7	11.8	6.0
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	----	7	----
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	----	----	2.59	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	No	----
Asbestos (Trace)	1332-21-4	-	-	----	----	----	No	----
Asbestos Type	1332-21-4	-	--	----	----	----	-	----
Sample weight (dry)	----	0.01	g	----	----	----	58.8	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	M. TRAN	----
Synthetic Mineral Fibre	----	-	--	----	----	----	No	----
Organic Fibre	----	-	--	----	----	----	No	----
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	2.0	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	0.2	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	<0.1	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	0.1	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	2.4	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	19	<5	<5	<5	<5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP01/0.3	CATP01/0.4	CATP02/0.1	CATP02/0.4	CATP02/0.8
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-008	EM2512262-009	EM2512262-010	EM2512262-011	EM2512262-012
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Barium	7440-39-3	10	mg/kg	<10	<10	**20**	<10	**40**
Beryllium	7440-41-7	1	mg/kg	<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**3**	**28**	**4**	**3**	**8**
Cobalt	7440-48-4	2	mg/kg	<2	<2	<2	<2	**7**
Copper	7440-50-8	5	mg/kg	<5	<5	**5**	<5	<5
Iron	7439-89-6	0.005	%	----	----	----	**0.341**	----
Lead	7439-92-1	5	mg/kg	<5	<5	**16**	**6**	<5
Manganese	7439-96-5	5	mg/kg	**10**	<5	**69**	**16**	<5
Nickel	7440-02-0	2	mg/kg	<2	**3**	**2**	<2	**5**
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	**17**	**67**	**13**	**13**	**33**
Zinc	7440-66-6	5	mg/kg	**14**	**5**	**73**	**21**	**14**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)								
Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	----	----	<2.5	----
EG049: Trivalent Chromium								
Trivalent Chromium	16065-83-1	2	mg/kg	**3**	----	----	**3**	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	----	----	**1.1**	----
Total Organic Carbon	----	0.5	%	----	----	----	**0.6**	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP01/0.3	CATP01/0.4	CATP02/0.1	CATP02/0.4	CATP02/0.8
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-008	EM2512262-009	EM2512262-010	EM2512262-011	EM2512262-012
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP01/0.3	CATP01/0.4	CATP02/0.1	CATP02/0.4	CATP02/0.8
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-008	EM2512262-009	EM2512262-010	EM2512262-011	EM2512262-012
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	----	----	<0.04	----	----
2.4-DB	94-82-6	0.02	mg/kg	----	----	<0.04	----	----
Dicamba	1918-00-9	0.02	mg/kg	----	----	<0.04	----	----
Mecoprop	93-65-2	0.02	mg/kg	----	----	<0.04	----	----
MCPA	94-74-6	0.02	mg/kg	----	----	<0.04	----	----
2.4-DP	120-36-5	0.02	mg/kg	----	----	<0.04	----	----
2.4-D	94-75-7	0.02	mg/kg	----	----	<0.04	----	----
Triclopyr	55335-06-3	0.02	mg/kg	----	----	<0.04	----	----
2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	----	----	<0.04	----	----
2.4.5-T	93-76-5	0.02	mg/kg	----	----	<0.04	----	----
MCPB	94-81-5	0.02	mg/kg	----	----	<0.04	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CATP01/0.3	CATP01/0.4	CATP02/0.1	CATP02/0.4	CATP02/0.8
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-008	EM2512262-009	EM2512262-010	EM2512262-011	EM2512262-012
					Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued									
Picloram	1918-02-1	0.02	mg/kg		----	----	<0.04	----	----
Clopyralid	1702-17-6	0.02	mg/kg		----	----	<0.04	----	----
Fluroxypyr	69377-81-7	0.02	mg/kg		----	----	<0.04	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**71.7**	**63.8**	**70.0**	**79.2**	**78.8**
2-Chlorophenol-D4	93951-73-6	0.5	%		**72.9**	**71.1**	**67.6**	**75.2**	**76.2**
2.4.6-Tribromophenol	118-79-6	0.5	%		**68.7**	**66.0**	**63.5**	**70.6**	**67.6**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**94.9**	**89.9**	**91.0**	**93.5**	**92.7**
Anthracene-d10	1719-06-8	0.5	%		**96.3**	**92.3**	**90.4**	**96.7**	**95.0**
4-Terphenyl-d14	1718-51-0	0.5	%		**107**	**105**	**107**	**109**	**112**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**77.6**	**74.6**	**77.8**	**73.6**	**74.7**
Toluene-D8	2037-26-5	0.2	%		**78.0**	**76.5**	**77.3**	**75.2**	**76.0**
4-Bromofluorobenzene	460-00-4	0.2	%		**93.0**	**90.2**	**85.7**	**86.5**	**90.7**
EP202S: Phenoxyacetic Acid Herbicide Surrogate									
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%		----	----	**67.0**	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP03/0.2	CATP03/0.7	CATP04/0.2	CATP04/0.4	CATP04/0.7
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-013	EM2512262-014	EM2512262-015	EM2512262-016	EM2512262-017
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**5.5**	**9.5**	**11.8**	**9.6**	**26.1**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**----**	**----**	**----**	**No**	**----**
Asbestos (Trace)	1332-21-4	-	-	**----**	**----**	**----**	**No**	**----**
Asbestos Type	1332-21-4	-	--	**----**	**----**	**----**	**-**	**----**
Sample weight (dry)	----	0.01	g	**----**	**----**	**----**	**85.3**	**----**
APPROVED IDENTIFIER:	----	-	--	**----**	**----**	**----**	**M. TRAN**	**----**
Synthetic Mineral Fibre	----	-	--	**----**	**----**	**----**	**Yes**	**----**
Organic Fibre	----	-	--	**----**	**----**	**----**	**No**	**----**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg	<10	**40**	**20**	<10	**260**
Beryllium	7440-41-7	1	mg/kg	<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**6**	**8**	**3**	**4**	**21**
Cobalt	7440-48-4	2	mg/kg	<2	**3**	<2	<2	**3**
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	<5	<5	<5	<5	<5
Manganese	7439-96-5	5	mg/kg	<5	<5	**26**	<5	<5
Nickel	7440-02-0	2	mg/kg	<2	**4**	<2	<2	**4**
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	**16**	**17**	**14**	**19**	**58**
Zinc	7440-66-6	5	mg/kg	**20**	<5	**46**	<5	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP03/0.2	CATP03/0.7	CATP04/0.2	CATP04/0.4	CATP04/0.7
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-013	EM2512262-014	EM2512262-015	EM2512262-016	EM2512262-017
				Result	Result	Result	Result	Result
EG048: Hexavalent Chromium (Alkaline Digest) - Continued								
Hexavalent Chromium	18540-29-9	0.5	mg/kg	----	<0.5	----	<0.5	----
EG049: Trivalent Chromium								
Trivalent Chromium	16065-83-1	2	mg/kg	----	**8**	----	**4**	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CATP03/0.2	CATP03/0.7	CATP04/0.2	CATP04/0.4	CATP04/0.7
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-013	EM2512262-014	EM2512262-015	EM2512262-016	EM2512262-017
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP202A: Phenoxyacetic Acid Herbicides by LCMS									
4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg		<0.02	----	<0.04	----	----
2.4-DB	94-82-6	0.02	mg/kg		<0.02	----	<0.04	----	----
Dicamba	1918-00-9	0.02	mg/kg		<0.02	----	<0.04	----	----
Mecoprop	93-65-2	0.02	mg/kg		<0.02	----	<0.04	----	----
MCPA	94-74-6	0.02	mg/kg		<0.02	----	<0.04	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP03/0.2	CATP03/0.7	CATP04/0.2	CATP04/0.4	CATP04/0.7
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-013	EM2512262-014	EM2512262-015	EM2512262-016	EM2512262-017
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
2.4-DP	120-36-5	0.02	mg/kg	<0.02	----	<0.04	----	----
2.4-D	94-75-7	0.02	mg/kg	<0.02	----	<0.04	----	----
Triclopyr	55335-06-3	0.02	mg/kg	<0.02	----	<0.04	----	----
2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.02	----	<0.04	----	----
2.4.5-T	93-76-5	0.02	mg/kg	<0.02	----	<0.04	----	----
MCPB	94-81-5	0.02	mg/kg	<0.02	----	<0.04	----	----
Picloram	1918-02-1	0.02	mg/kg	<0.02	----	<0.04	----	----
Clopyralid	1702-17-6	0.02	mg/kg	<0.02	----	<0.04	----	----
Fluroxypyr	69377-81-7	0.02	mg/kg	<0.02	----	<0.04	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**66.3**	**77.2**	**75.2**	**74.9**	**71.9**
2-Chlorophenol-D4	93951-73-6	0.5	%	**73.6**	**79.7**	**74.0**	**76.9**	**75.2**
2.4.6-Tribromophenol	118-79-6	0.5	%	**66.4**	**71.3**	**67.7**	**73.3**	**65.0**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**91.7**	**98.8**	**91.1**	**96.9**	**91.9**
Anthracene-d10	1719-06-8	0.5	%	**94.3**	**101**	**94.0**	**99.6**	**94.4**
4-Terphenyl-d14	1718-51-0	0.5	%	**108**	**114**	**108**	**112**	**109**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**88.6**	**72.5**	**79.1**	**78.8**	**56.0**
Toluene-D8	2037-26-5	0.2	%	**89.6**	**72.1**	**80.8**	**77.2**	**56.4**
4-Bromofluorobenzene	460-00-4	0.2	%	**105**	**83.8**	**91.9**	**89.5**	**74.1**
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	**73.1**	----	**75.7**	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP05/0.1	CATP05/0.4	CATP05/0.8	CATP06/0.1	CATP06/0.3
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-018	EM2512262-019	EM2512262-020	EM2512262-021	EM2512262-022
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	----	----	----	5.5
EA002-AD: pH (Soils) dried at 40°C								
pH Value	----	0.1	pH Unit	----	----	----	----	5.6
EA010-AD: Conductivity (Soils) dried at 40°C								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	----	----	21
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	22.4	12.4	19.6	32.1	8.7
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	----	----	10
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	----	----	----	2.58
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	----	No
Asbestos (Trace)	1332-21-4	-	-	----	----	----	----	No
Asbestos Type	1332-21-4	-	--	----	----	----	----	-
Sample weight (dry)	----	0.01	g	----	----	----	----	80.9
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	M. TRAN
Synthetic Mineral Fibre	----	-	--	----	----	----	----	No
Organic Fibre	----	-	--	----	----	----	----	No
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	----	0.7
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	----	0.2
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	----	<0.1
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	----	<0.1
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	----	1.2
ED042T: Total Sulfur by LECO								
Sulfur - Total as S (LECO)	----	0.01	%	0.13	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP05/0.1	CATP05/0.4	CATP05/0.8	CATP06/0.1	CATP06/0.3
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-018	EM2512262-019	EM2512262-020	EM2512262-021	EM2512262-022
				Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg	**20**	<10	<10	**20**	<10
Beryllium	7440-41-7	1	mg/kg	<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**5**	**24**	**31**	**4**	**6**
Cobalt	7440-48-4	2	mg/kg	**5**	<2	<2	**3**	<2
Copper	7440-50-8	5	mg/kg	**9**	<5	<5	**11**	<5
Iron	7439-89-6	0.005	%	**----**	**----**	**----**	**----**	**1.33**
Lead	7439-92-1	5	mg/kg	<5	<5	<5	**66**	<5
Manganese	7439-96-5	5	mg/kg	**185**	<5	<5	**86**	**8**
Nickel	7440-02-0	2	mg/kg	**8**	**3**	**3**	**6**	<2
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	**9**	**58**	**48**	**11**	**48**
Zinc	7440-66-6	5	mg/kg	**11**	<5	<5	**123**	**5**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)								
Hexavalent Chromium	18540-29-9	0.5	mg/kg	**----**	<0.5	**----**	**----**	<0.5
EG049: Trivalent Chromium								
Trivalent Chromium	16065-83-1	2	mg/kg	**----**	**24**	**----**	**----**	**6**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	**0.1**	**----**	**----**	**----**	**----**
EP004: Organic Matter								
Organic Matter	----	0.5	%	**----**	**----**	**----**	**----**	**0.7**
Total Organic Carbon	----	0.5	%	**----**	**----**	**----**	**----**	<0.5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP05/0.1	CATP05/0.4	CATP05/0.8	CATP06/0.1	CATP06/0.3
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-018	EM2512262-019	EM2512262-020	EM2512262-021	EM2512262-022
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	**110**	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**110**	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CATP05/0.1	CATP05/0.4	CATP05/0.8	CATP06/0.1	CATP06/0.3
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-018	EM2512262-019	EM2512262-020	EM2512262-021	EM2512262-022
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		**120**	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		**120**	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP202A: Phenoxyacetic Acid Herbicides by LCMS									
4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg		<0.04	----	----	<0.04	----
2.4-DB	94-82-6	0.02	mg/kg		<0.04	----	----	<0.04	----
Dicamba	1918-00-9	0.02	mg/kg		<0.04	----	----	<0.04	----
Mecoprop	93-65-2	0.02	mg/kg		<0.04	----	----	<0.04	----
MCPA	94-74-6	0.02	mg/kg		<0.04	----	----	<0.04	----
2.4-DP	120-36-5	0.02	mg/kg		<0.04	----	----	<0.04	----
2.4-D	94-75-7	0.02	mg/kg		<0.04	----	----	<0.04	----
Triclopyr	55335-06-3	0.02	mg/kg		<0.04	----	----	<0.04	----
2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg		<0.04	----	----	<0.04	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP05/0.1	CATP05/0.4	CATP05/0.8	CATP06/0.1	CATP06/0.3
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-018	EM2512262-019	EM2512262-020	EM2512262-021	EM2512262-022
				Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued								
2.4.5-T	93-76-5	0.02	mg/kg	<0.04	----	----	<0.04	----
MCPB	94-81-5	0.02	mg/kg	<0.04	----	----	<0.04	----
Picloram	1918-02-1	0.02	mg/kg	<0.04	----	----	<0.04	----
Clopyralid	1702-17-6	0.02	mg/kg	<0.04	----	----	<0.04	----
Fluroxypyr	69377-81-7	0.02	mg/kg	<0.04	----	----	<0.04	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	73.7	65.2	74.6	66.2	77.4
2-Chlorophenol-D4	93951-73-6	0.5	%	66.9	73.2	76.4	73.7	76.7
2.4.6-Tribromophenol	118-79-6	0.5	%	44.6	74.7	71.9	72.0	67.6
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	88.7	93.1	94.8	91.7	93.4
Anthracene-d10	1719-06-8	0.5	%	64.9	91.2	98.8	91.0	97.2
4-Terphenyl-d14	1718-51-0	0.5	%	94.4	112	111	111	111
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	87.9	74.0	75.7	74.0	69.9
Toluene-D8	2037-26-5	0.2	%	69.1	74.6	75.0	71.7	68.7
4-Bromofluorobenzene	460-00-4	0.2	%	65.8	88.8	89.6	75.2	80.5
EP202S: Phenoxyacetic Acid Herbicide Surrogate								
2.4-Dichlorophenyl Acetic Acid	19719-28-9	0.02	%	64.2	----	----	63.1	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP06/0.5	CATR01-F/0.1	CATR01-F/0.5	CATR01-F/1.2	CATR01-F/1.9
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-023	EM2512262-025	EM2512262-026	EM2512262-027	EM2512262-028
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	24.4	13.4	8.9	11.2	5.6
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-	----	No	No	No	No
Asbestos Type	1332-21-4	-	--	----	-	-	-	-
Sample weight (dry)	----	0.01	g	----	54.9	84.9	47.9	55.7
APPROVED IDENTIFIER:	----	-	--	----	M. TRAN	M. TRAN	M. TRAN	M. TRAN
Synthetic Mineral Fibre	----	-	--	----	Yes	No	Yes	Yes
Organic Fibre	----	-	--	----	No	No	No	No
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg	10	30	10	40	20
Beryllium	7440-41-7	1	mg/kg	<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	29	8	17	6	6
Cobalt	7440-48-4	2	mg/kg	<2	5	3	4	3
Copper	7440-50-8	5	mg/kg	<5	11	6	12	10
Lead	7439-92-1	5	mg/kg	<5	15	21	19	30
Manganese	7439-96-5	5	mg/kg	<5	114	37	221	71
Nickel	7440-02-0	2	mg/kg	<2	6	5	6	5
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	74	20	20	14	30
Zinc	7440-66-6	5	mg/kg	<5	73	105	91	70
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATP06/0.5	CATR01-F/0.1	CATR01-F/0.5	CATR01-F/1.2	CATR01-F/1.9
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-023	EM2512262-025	EM2512262-026	EM2512262-027	EM2512262-028
				Result	Result	Result	Result	Result
EG048: Hexavalent Chromium (Alkaline Digest) - Continued								
Hexavalent Chromium	18540-29-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
EG049: Trivalent Chromium								
Trivalent Chromium	16065-83-1	2	mg/kg	----	8	17	6	6
EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel)								
Initial pH	----	0.1	pH Unit	----	7.5	8.0	8.0	6.5
After HCl pH	----	0.1	pH Unit	----	1.4	1.4	1.4	1.4
Extraction Fluid Number	----	1	-	----	5	1	5	5
Final pH	----	0.1	pH Unit	----	5.0	4.9	5.0	4.9
EN33Z: ZHE TCLP Leach								
Extraction Fluid Number	----	0.1	pH Unit	----	5.0	5.0	5.0	5.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CATP06/0.5	CATR01-F/0.1	CATR01-F/0.5	CATR01-F/1.2	CATR01-F/1.9
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-023	EM2512262-025	EM2512262-026	EM2512262-027	EM2512262-028
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons									
Benzo(a)pyrene	50-32-8	0.05	mg/kg		----	<0.05	<0.05	**0.05**	<0.05
^ Sum of polycyclic aromatic hydrocarbons	----	0.05	mg/kg		----	<0.05	<0.05	**0.05**	<0.05
Pyrene	129-00-0	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg		----	<1.0	<1.0	<1.0	<1.0
^ Benzo(a)pyrene TEQ (zero)	----	0.05	mg/kg		----	<0.05	<0.05	**0.05**	<0.05
^ Benzo(a)pyrene TEQ (LOR)	----	0.05	mg/kg		----	**0.76**	**0.76**	**0.76**	**0.76**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.05	mg/kg		----	**0.38**	**0.38**	**0.40**	**0.38**
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CATP06/0.5	CATR01-F/0.1	CATR01-F/0.5	CATR01-F/1.2	CATR01-F/1.9
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-023	EM2512262-025	EM2512262-026	EM2512262-027	EM2512262-028
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	**130**	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	**130**	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	**180**	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	**180**	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**70.1**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**72.3**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**66.4**	----	----	----	----
EP075(SIM)T: PAH Surrogates									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CATP06/0.5	CATR01-F/0.1	CATR01-F/0.5	CATR01-F/1.2	CATR01-F/1.9
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-023	EM2512262-025	EM2512262-026	EM2512262-027	EM2512262-028
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
2-Fluorobiphenyl	321-60-8	0.5	%		89.2	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		94.3	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		106	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		----	90.0	86.1	80.4	84.4
Anthracene-d10	1719-06-8	0.025	%		----	84.8	87.8	76.6	81.5
4-Terphenyl-d14	1718-51-0	0.025	%		----	91.2	91.0	80.9	85.3
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		71.4	85.1	84.3	83.5	84.1
Toluene-D8	2037-26-5	0.2	%		70.8	72.4	74.6	71.1	74.2
4-Bromofluorobenzene	460-00-4	0.2	%		82.4	95.7	100	88.2	93.9

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATR01-F/2.4	CATR01-F/3.0	CATR01-C/0.2	CATR01-C/0.5	CATR01-C/0.9
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-029	EM2512262-030	EM2512262-031	EM2512262-032	EM2512262-033
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	17.6	25.4	19.7	31.3	8.5
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	47.7	39.7	57.6	40.1	73.4
APPROVED IDENTIFIER:	----	-	--	M. TRAN	M. TRAN	M. TRAN	M. TRAN	M. TRAN
Synthetic Mineral Fibre	----	-	--	No	No	Yes	No	Yes
Organic Fibre	----	-	--	No	No	Yes	Yes	No
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	11	67	21
Barium	7440-39-3	10	mg/kg	40	60	20	30	<10
Beryllium	7440-41-7	1	mg/kg	<1	1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	26	54	7	9	7
Cobalt	7440-48-4	2	mg/kg	10	16	5	6	<2
Copper	7440-50-8	5	mg/kg	10	15	12	22	<5
Lead	7439-92-1	5	mg/kg	9	<5	17	15	<5
Manganese	7439-96-5	5	mg/kg	64	<5	108	260	11
Nickel	7440-02-0	2	mg/kg	20	28	7	12	2
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	27	32	16	14	38
Zinc	7440-66-6	5	mg/kg	120	20	72	98	13
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATR01-F/2.4	CATR01-F/3.0	CATR01-C/0.2	CATR01-C/0.5	CATR01-C/0.9
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-029	EM2512262-030	EM2512262-031	EM2512262-032	EM2512262-033
				Result	Result	Result	Result	Result
EG048: Hexavalent Chromium (Alkaline Digest) - Continued								
Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EG049: Trivalent Chromium								
Trivalent Chromium	16065-83-1	2	mg/kg	**26**	**54**	**7**	**9**	**7**
EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel)								
Initial pH	----	0.1	pH Unit	**6.8**	----	----	----	----
After HCl pH	----	0.1	pH Unit	**1.4**	----	----	----	----
Extraction Fluid Number	----	1	-	**5**	----	----	----	----
Final pH	----	0.1	pH Unit	**4.9**	----	----	----	----
EN33Z: ZHE TCLP Leach								
Extraction Fluid Number	----	0.1	pH Unit	**5.0**	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.05	mg/kg	**0.06**	<0.05	<0.05	<0.05	<0.05
^ Sum of polycyclic aromatic hydrocarbons	----	0.05	mg/kg	**0.06**	<0.05	<0.05	<0.05	<0.05
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
^ Benzo(a)pyrene TEQ (zero)	----	0.05	mg/kg	**0.06**	<0.05	<0.05	<0.05	<0.05
^ Benzo(a)pyrene TEQ (LOR)	----	0.05	mg/kg	**0.77**	**0.76**	**0.76**	**0.76**	**0.76**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.05	mg/kg	**0.42**	**0.38**	**0.38**	**0.38**	**0.38**
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CATR01-F/2.4	CATR01-F/3.0	CATR01-C/0.2	CATR01-C/0.5	CATR01-C/0.9
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-029	EM2512262-030	EM2512262-031	EM2512262-032	EM2512262-033
					Result	Result	Result	Result	Result
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		**120**	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		**120**	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		**150**	<100	<100	**110**	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		**150**	<50	<50	**110**	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CATR01-F/2.4	CATR01-F/3.0	CATR01-C/0.2	CATR01-C/0.5	CATR01-C/0.9
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-029	EM2512262-030	EM2512262-031	EM2512262-032	EM2512262-033
					Result	Result	Result	Result	Result
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		**88.0**	**76.6**	**85.8**	**83.9**	**96.6**
Anthracene-d10	1719-06-8	0.025	%		**86.8**	**79.0**	**86.9**	**74.0**	**98.1**
4-Terphenyl-d14	1718-51-0	0.025	%		**91.2**	**79.3**	**87.8**	**83.2**	**99.6**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**80.6**	**87.1**	**80.4**	**79.8**	**79.8**
Toluene-D8	2037-26-5	0.2	%		**73.1**	**77.9**	**68.0**	**66.0**	**69.3**
4-Bromofluorobenzene	460-00-4	0.2	%		**95.0**	**106**	**88.1**	**80.2**	**89.7**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATR01-A/0.1	CATR01-A/0.3	CATR02/0.2	CATR02/0.5	CATR02/0.9
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-034	EM2512262-035	EM2512262-036	EM2512262-037	EM2512262-038
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	28.6	5.2	12.0	5.7	7.0
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	98.9	46.9	52.9	67.0	35.6
APPROVED IDENTIFIER:	----	-	--	M. TRAN	M. TRAN	M. TRAN	M. TRAN	M. TRAN
Synthetic Mineral Fibre	----	-	--	Yes	No	No	No	No
Organic Fibre	----	-	--	No	Yes	Yes	Yes	Yes
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	88	15	<5	133	71
Barium	7440-39-3	10	mg/kg	60	<10	30	50	40
Beryllium	7440-41-7	1	mg/kg	<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	<2	10	16	18
Cobalt	7440-48-4	2	mg/kg	6	<2	4	8	5
Copper	7440-50-8	5	mg/kg	26	<5	8	39	19
Lead	7439-92-1	5	mg/kg	28	<5	20	27	19
Manganese	7439-96-5	5	mg/kg	166	<5	126	235	82
Nickel	7440-02-0	2	mg/kg	8	<2	6	14	8
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	23	7	22	26	55
Zinc	7440-66-6	5	mg/kg	134	<5	95	165	110
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CATR01-A/0.1	CATR01-A/0.3	CATR02/0.2	CATR02/0.5	CATR02/0.9
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-034	EM2512262-035	EM2512262-036	EM2512262-037	EM2512262-038
				Result	Result	Result	Result	Result
EG048: Hexavalent Chromium (Alkaline Digest) - Continued								
Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EG049: Trivalent Chromium								
Trivalent Chromium	16065-83-1	2	mg/kg	**10**	<2	**10**	**16**	**18**
EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel)								
Initial pH	----	0.1	pH Unit	**5.0**	**7.3**	**----**	**8.4**	**6.7**
After HCl pH	----	0.1	pH Unit	**1.3**	**1.4**	**----**	**1.4**	**1.4**
Extraction Fluid Number	----	1	-	**5**	**5**	**----**	**5**	**5**
Final pH	----	0.1	pH Unit	**4.9**	**4.9**	**----**	**4.9**	**5.0**
EN33Z: ZHE TCLP Leach								
Extraction Fluid Number	----	0.1	pH Unit	**5.0**	**5.0**	**----**	**5.0**	**5.0**
EP075B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.05	mg/kg	**0.19**	<0.05	<0.05	**0.16**	<0.05
^ Sum of polycyclic aromatic hydrocarbons	----	0.05	mg/kg	**0.19**	<0.05	<0.05	**0.16**	<0.05
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
^ Benzo(a)pyrene TEQ (zero)	----	0.05	mg/kg	**0.19**	<0.05	<0.05	**0.16**	<0.05
^ Benzo(a)pyrene TEQ (LOR)	----	0.05	mg/kg	**0.90**	**0.76**	**0.76**	**0.87**	**0.76**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.05	mg/kg	**0.54**	**0.38**	**0.38**	**0.52**	**0.38**
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CATR01-A/0.1	CATR01-A/0.3	CATR02/0.2	CATR02/0.5	CATR02/0.9
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-034	EM2512262-035	EM2512262-036	EM2512262-037	EM2512262-038
					Result	Result	Result	Result	Result
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	**120**	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	**120**	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	**180**	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	**180**	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CATR01-A/0.1	CATR01-A/0.3	CATR02/0.2	CATR02/0.5	CATR02/0.9
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-034	EM2512262-035	EM2512262-036	EM2512262-037	EM2512262-038
					Result	Result	Result	Result	Result
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		**88.9**	**92.5**	**86.0**	**87.5**	**92.3**
Anthracene-d10	1719-06-8	0.025	%		**90.9**	**94.7**	**83.9**	**84.9**	**88.0**
4-Terphenyl-d14	1718-51-0	0.025	%		**93.8**	**95.1**	**88.3**	**90.2**	**92.7**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**79.5**	**87.3**	**83.1**	**83.3**	**86.5**
Toluene-D8	2037-26-5	0.2	%		**67.5**	**74.6**	**70.7**	**71.3**	**74.9**
4-Bromofluorobenzene	460-00-4	0.2	%		**88.4**	**100**	**91.3**	**90.7**	**97.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	QCP-01	QCP-02	----	----	----
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EM2512262-039	EM2512262-040	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**6.6**	**16.0**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	----	----
Barium	7440-39-3	10	mg/kg	<10	<10	----	----	----
Beryllium	7440-41-7	1	mg/kg	<1	<1	----	----	----
Boron	7440-42-8	50	mg/kg	<50	<50	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**5**	**2**	----	----	----
Cobalt	7440-48-4	2	mg/kg	<2	<2	----	----	----
Copper	7440-50-8	5	mg/kg	<5	<5	----	----	----
Lead	7439-92-1	5	mg/kg	<5	**10**	----	----	----
Manganese	7439-96-5	5	mg/kg	**7**	**18**	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	<2	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
Vanadium	7440-62-2	5	mg/kg	**44**	**9**	----	----	----
Zinc	7440-66-6	5	mg/kg	**7**	**27**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QCP-01	QCP-02	----	----	----
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2512262-039	EM2512262-040	--------	--------	--------
					Result	Result	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	**0.6**	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QCP-01	QCP-02	----	----	----
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2512262-039	EM2512262-040	--------	--------	--------
					Result	Result	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**82.2**	**83.8**	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**94.4**	**96.0**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**87.9**	**89.2**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**83.6**	**85.9**	----	----	----
Toluene-D8	2037-26-5	0.2	%		**74.0**	**73.6**	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**101**	**95.7**	----	----	----

Analytical Results

Sub-Matrix: TCLP LEACHATE (Matrix: WATER)				Sample ID	CATR01-F/0.1	CATR01-F/0.5	CATR01-F/1.2	CATR01-F/1.9	CATR01-F/2.4
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-025	EM2512262-026	EM2512262-027	EM2512262-028	EM2512262-029
					Result	Result	Result	Result	Result
EG005(ED093)C: Leachable Metals by ICPAES									
Arsenic	7440-38-2	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Barium	7440-39-3	0.1	mg/L		**0.1**	**0.3**	**0.4**	**0.2**	**0.3**
Beryllium	7440-41-7	0.05	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Boron	7440-42-8	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	7440-43-9	0.05	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Cobalt	7440-48-4	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Copper	7440-50-8	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Lead	7439-92-1	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.1	mg/L		**0.2**	**0.3**	**1.1**	**0.1**	**0.3**
Nickel	7440-02-0	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Selenium	7782-49-2	0.05	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium	7440-62-2	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	7440-66-6	0.1	mg/L		**0.4**	**1.4**	**0.6**	**0.4**	**1.4**
EG035C: Leachable Mercury by FIMS									
Mercury	7439-97-6	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: TCLP LEACHATE (Matrix: WATER)				Sample ID	CATR01-F/0.1	CATR01-F/0.5	CATR01-F/1.2	CATR01-F/1.9	CATR01-F/2.4
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-025	EM2512262-026	EM2512262-027	EM2512262-028	EM2512262-029
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**18.5**	**25.0**	**27.1**	**21.2**	**23.7**
2-Chlorophenol-D4	93951-73-6	1.0	%		**49.2**	**51.5**	**72.9**	**53.6**	**57.7**
2.4.6-Tribromophenol	118-79-6	1.0	%		**64.5**	**78.2**	**109**	**61.8**	**73.8**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**53.2**	**46.9**	**72.4**	**61.8**	**65.0**
Anthracene-d10	1719-06-8	1.0	%		**54.3**	**53.5**	**82.6**	**53.9**	**65.0**
4-Terphenyl-d14	1718-51-0	1.0	%		**59.1**	**61.6**	**114**	**58.1**	**62.4**

Analytical Results

Sub-Matrix: TCLP LEACHATE (Matrix: WATER)			Sample ID	CATR01-F/0.1	CATR01-F/0.5	CATR01-F/1.2	CATR01-F/1.9	CATR01-F/2.4
			Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EM2512262-025	EM2512262-026	EM2512262-027	EM2512262-028	EM2512262-029
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								

Analytical Results

Sub-Matrix: TCLP LEACHATE (Matrix: WATER)				Sample ID	CATR01-A/0.1	CATR01-A/0.3	CATR02/0.5	CATR02/0.9	----
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	----
Compound	CAS Number	LOR	Unit		EM2512262-034	EM2512262-035	EM2512262-037	EM2512262-038	--------
					Result	Result	Result	Result	----
EG005(ED093)C: Leachable Metals by ICPAES									
Arsenic	7440-38-2	0.1	mg/L		**0.2**	**0.2**	**0.2**	<0.1	----
Barium	7440-39-3	0.1	mg/L		**0.1**	<0.1	**0.2**	<0.1	----
Beryllium	7440-41-7	0.05	mg/L		<0.05	<0.05	<0.05	<0.05	----
Boron	7440-42-8	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	----
Cadmium	7440-43-9	0.05	mg/L		<0.05	<0.05	<0.05	<0.05	----
Chromium	7440-47-3	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	----
Cobalt	7440-48-4	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	----
Copper	7440-50-8	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	----
Lead	7439-92-1	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	----
Manganese	7439-96-5	0.1	mg/L		<0.1	**0.1**	**0.4**	**0.1**	----
Nickel	7440-02-0	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	----
Selenium	7782-49-2	0.05	mg/L		<0.05	<0.05	<0.05	<0.05	----
Vanadium	7440-62-2	0.1	mg/L		<0.1	<0.1	<0.1	<0.1	----
Zinc	7440-66-6	0.1	mg/L		**0.3**	<0.1	**0.8**	**0.4**	----
EG035C: Leachable Mercury by FIMS									
Mercury	7439-97-6	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----

Analytical Results

Sub-Matrix: TCLP LEACHATE (Matrix: WATER)				Sample ID	CATR01-A/0.1	CATR01-A/0.3	CATR02/0.5	CATR02/0.9	----
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	----
Compound	CAS Number	LOR	Unit		EM2512262-034	EM2512262-035	EM2512262-037	EM2512262-038	--------
					Result	Result	Result	Result	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	<100	<100	<100	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L		<100	<100	<100	<100	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**22.0**	**24.4**	**22.3**	**19.9**	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**58.2**	**60.0**	**60.5**	**43.3**	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**65.9**	**71.2**	**69.2**	**52.6**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**67.5**	**72.4**	**67.0**	**48.3**	----
Anthracene-d10	1719-06-8	1.0	%		**67.0**	**67.2**	**58.7**	**45.6**	----
4-Terphenyl-d14	1718-51-0	1.0	%		**70.6**	**69.9**	**74.3**	**62.3**	----

Analytical Results

Sub-Matrix: TCLP LEACHATE (Matrix: WATER)				Sample ID	CATR01-A/0.1	CATR01-A/0.3	CATR02/0.5	CATR02/0.9	----
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	----
Compound	CAS Number	LOR	Unit		EM2512262-034	EM2512262-035	EM2512262-037	EM2512262-038	--------
					Result	Result	Result	Result	----
EP075(SIM)T: PAH Surrogates - Continued									

Analytical Results

Sub-Matrix: TCLP ZHE LEACHATE (Matrix: WATER)				Sample ID	CATR01-F/0.1	CATR01-F/0.5	CATR01-F/1.2	CATR01-F/1.9	CATR01-F/2.4
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00
Compound	CAS Number	LOR	Unit		EM2512262-025	EM2512262-026	EM2512262-027	EM2512262-028	EM2512262-029
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		108	107	108	108	108
Toluene-D8	2037-26-5	2	%		94.6	99.3	99.0	99.5	99.6
4-Bromofluorobenzene	460-00-4	2	%		110	114	116	116	116

Analytical Results

Sub-Matrix: TCLP ZHE LEACHATE (Matrix: WATER)				Sample ID	CATR01-A/0.1	CATR01-A/0.3	CATR02/0.5	CATR02/0.9	----
				Sampling date / time	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	08-Jul-2025 00:00	----
Compound	CAS Number	LOR	Unit		EM2512262-034	EM2512262-035	EM2512262-037	EM2512262-038	--------
					Result	Result	Result	Result	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	**----**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	**----**
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	**----**
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	**----**
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	**----**
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	**----**
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	**----**
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	**----**
^ **Total Xylenes**	----	2	µg/L		<2	<2	<2	<2	**----**
^ **Sum of BTEX**	----	1	µg/L		<1	<1	<1	<1	**----**
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	**----**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**110**	**107**	**110**	**103**	**----**
Toluene-D8	2037-26-5	2	%		**99.9**	**97.6**	**99.6**	**96.3**	**----**
4-Bromofluorobenzene	460-00-4	2	%		**113**	**112**	**113**	**108**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	QCR-01	----	----	----	----
			Sampling date / time	07-Jul-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM2512262-005	--------	--------	--------	--------
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	**0.006**	----	----	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	----	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.127**	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L	**0.032**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.072**	----	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.013**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L	**0.037**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.041**	----	----	----	----
Lead	7439-92-1	0.001	mg/L	**0.004**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L	**0.02**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	**0.037**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QCR-01	----	----	----	----
				Sampling date / time	07-Jul-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2512262-005	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QCR-01	----	----	----	----
				Sampling date / time	07-Jul-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2512262-005	--------	--------	--------	--------
					Result	----	----	----	----
EP080: BTEXN - Continued									
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L		<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**32.0**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**72.0**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**119**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**74.8**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**84.7**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**76.4**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**96.8**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**92.7**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**108**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	CATP01/0.1 - 08-Jul-2025 00:00	Grey soil with rock and organic matter.
EA200: Description	CATP02/0.4 - 08-Jul-2025 00:00	Grey soil with rock and organic matter.
EA200: Description	CATP04/0.4 - 08-Jul-2025 00:00	Grey soil with synthetic mineral fibres, rock and organic matter.
EA200: Description	CATP06/0.3 - 08-Jul-2025 00:00	Brown rocky soil with organic matter.
EA200: Description	CATR01-F/0.1 - 08-Jul-2025 00:00	Brown soil with synthetic mineral fibres, rock and organic matter.
EA200: Description	CATR01-F/0.5 - 08-Jul-2025 00:00	Brown soil with rock and organic matter.
EA200: Description	CATR01-F/1.2 - 08-Jul-2025 00:00	Brown soil with synthetic mineral fibres, rock and organic matter.
EA200: Description	CATR01-F/1.9 - 08-Jul-2025 00:00	Brown soil with synthetic mineral fibres, rock and organic matter.
EA200: Description	CATR01-F/2.4 - 08-Jul-2025 00:00	Brown soil with rock and organic matter.
EA200: Description	CATR01-F/3.0 - 08-Jul-2025 00:00	Beige clay like soil with rock and organic matter.
EA200: Description	CATR01-C/0.2 - 08-Jul-2025 00:00	Grey soil with synthetic mineral fibres. rock and organic matter.
EA200: Description	CATR01-C/0.5 - 08-Jul-2025 00:00	Grey soil with rock and organic matter.
EA200: Description	CATR01-C/0.9 - 08-Jul-2025 00:00	Grey rocky soil with synthetic mineral fibres.
EA200: Description	CATR01-A/0.1 - 08-Jul-2025 00:00	Grey rocky soil with synthetic mineral fibres.
EA200: Description	CATR01-A/0.3 - 08-Jul-2025 00:00	Brown soil with rock and organic matter.
EA200: Description	CATR02/0.2 - 08-Jul-2025 00:00	Brown soil with rock and organic matter.
EA200: Description	CATR02/0.5 - 08-Jul-2025 00:00	Brown soil with rock and organic matter.
EA200: Description	CATR02/0.9 - 08-Jul-2025 00:00	Brown soil with rock and organic matter.

Surrogate Control Limits

Sub-Matrix: LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	51
2-Chlorophenol-D4	93951-73-6	30	114
2.4.6-Tribromophenol	118-79-6	26	133
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	35	127
Anthracene-d10	1719-06-8	44	122
4-Terphenyl-d14	1718-51-0	44	124

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP075T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	35	126
Anthracene-d10	1719-06-8	40	135
4-Terphenyl-d14	1718-51-0	42	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124
EP202S: Phenoxyacetic Acid Herbicide Surrogate			
2.4-Dichlorophenyl Acetic Acid	19719-28-9	45	139

Sub-Matrix: TCLP LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	51
2-Chlorophenol-D4	93951-73-6	30	114
2.4.6-Tribromophenol	118-79-6	26	133
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	35	127
Anthracene-d10	1719-06-8	44	122

Sub-Matrix: TCLP LEACHATE		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)T: PAH Surrogates - Continued			
4-Terphenyl-d14	1718-51-0	44	124

Sub-Matrix: TCLP ZHE LEACHATE		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	51
2-Chlorophenol-D4	93951-73-6	30	114
2.4.6-Tribromophenol	118-79-6	26	133
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	35	127
Anthracene-d10	1719-06-8	44	122
4-Terphenyl-d14	1718-51-0	44	124
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry / Biology).

(SOIL) ED042T: Total Sulfur by LECO

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry / Biology).

(SOIL) EA150: Soil Classification based on Particle Size

(SOIL) EA152: Soil Particle Density

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry / Biology).

(SOIL) EP202A: Phenoxyacetic Acid Herbicides by LCMS

(SOIL) EP202S: Phenoxyacetic Acid Herbicide Surrogate

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EM2512262**		
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: Mr Eduardo Pereira Maes	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: epereiramaes@pittsh.com.au	E-mail	: Hannah.White@alsglobal.com
Telephone	: 0362101400	Telephone	: +61-3-8549 9600
Facsimile	: ----	Facsimile	: +61-3-8549 9626
Project	: Cadbury ESA	Page	: 1 of 6
Order number	: P.23.1303	Quote number	: EM2025PITSHE0014 (EM25PITSHE0014)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: KIERAN RICHARDS		

Dates

Date Samples Received	: 09-Jul-2025 10:45	Issue Date	: 11-Jul-2025
Client Requested Due Date	: 22-Jul-2025	Scheduled Reporting Date	: **22-Jul-2025**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 2.9°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 40 / 39

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples 007 (one jar), 021, 022 023, and 039 appear to have become partially waterlogged with ice melt.**
- **Asbestos has been omitted for samples 008 and 019 due to lack of an asbestos bag.**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Melbourne, NATA accreditation no. 825, site no. 13778.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Samples logged across two workorders (EM2512262, EM2512276) due to reporting requirements for dioxins and furans.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EM2512262-003 : [07-Jul-2025] : CABH02/0.3 (Ballast)

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EG035C Leachable Mercury	SOIL - EN40-G Miscellaneous Leachates Procedure - Glass	SOIL - EP202 (solids) Phenoxyacetic acids	SOIL - S-03 15 Metals (NEPM 2013 Suite - incl. Digestion)	SOIL - S-07 TRH/BTEXN/PAH (SIM)	SOIL - W-07 TRH/BTEXN/PAH
EM2512262-001	07-Jul-2025 00:00	CABH01/0.3	✓			✓	✓	✓	
EM2512262-002	07-Jul-2025 00:00	CABH02/0.3	✓			✓	✓	✓	
EM2512262-003	07-Jul-2025 00:00	CABH02/0.3 (Ballast)		✓	✓				✓
EM2512262-004	07-Jul-2025 00:00	CABH02/0.4	✓			✓	✓	✓	
EM2512262-006	07-Jul-2025 00:00	TB	✓						
EM2512262-007	08-Jul-2025 00:00	CATP01/0.1	✓			✓	✓	✓	
EM2512262-008	08-Jul-2025 00:00	CATP01/0.3	✓				✓	✓	
EM2512262-009	08-Jul-2025 00:00	CATP01/0.4	✓				✓	✓	
EM2512262-010	08-Jul-2025 00:00	CATP02/0.1	✓			✓	✓	✓	
EM2512262-011	08-Jul-2025 00:00	CATP02/0.4	✓				✓	✓	
EM2512262-012	08-Jul-2025 00:00	CATP02/0.8	✓				✓	✓	
EM2512262-013	08-Jul-2025 00:00	CATP03/0.2	✓			✓	✓	✓	
EM2512262-014	08-Jul-2025 00:00	CATP03/0.7	✓				✓	✓	
EM2512262-015	08-Jul-2025 00:00	CATP04/0.2	✓			✓	✓	✓	
EM2512262-016	08-Jul-2025 00:00	CATP04/0.4	✓				✓	✓	
EM2512262-017	08-Jul-2025 00:00	CATP04/0.7	✓				✓	✓	
EM2512262-018	08-Jul-2025 00:00	CATP05/0.1	✓			✓	✓	✓	
EM2512262-019	08-Jul-2025 00:00	CATP05/0.4	✓				✓	✓	
EM2512262-020	08-Jul-2025 00:00	CATP05/0.8	✓				✓	✓	
EM2512262-021	08-Jul-2025 00:00	CATP06/0.1	✓			✓	✓	✓	
EM2512262-022	08-Jul-2025 00:00	CATP06/0.3	✓				✓	✓	
EM2512262-023	08-Jul-2025 00:00	CATP06/0.5	✓				✓	✓	
EM2512262-025	08-Jul-2025 00:00	CATR01-F/0.1	✓	✓			✓		✓
EM2512262-026	08-Jul-2025 00:00	CATR01-F/0.5	✓	✓			✓		✓
EM2512262-027	08-Jul-2025 00:00	CATR01-F/1.2	✓	✓			✓		✓
EM2512262-028	08-Jul-2025 00:00	CATR01-F/1.9	✓	✓			✓		✓
EM2512262-029	08-Jul-2025 00:00	CATR01-F/2.4	✓	✓			✓		✓
EM2512262-030	08-Jul-2025 00:00	CATR01-F/3.0	✓				✓		
EM2512262-031	08-Jul-2025 00:00	CATR01-C/0.2	✓				✓		
EM2512262-032	08-Jul-2025 00:00	CATR01-C/0.5	✓				✓		
EM2512262-033	08-Jul-2025 00:00	CATR01-C/0.9	✓				✓		
EM2512262-034	08-Jul-2025 00:00	CATR01-A/0.1	✓	✓			✓		✓
EM2512262-035	08-Jul-2025 00:00	CATR01-A/0.3	✓	✓			✓		✓

			SOIL - EA055-103 Moisture Content	SOIL - EG035C Leachable Mercury	SOIL - EN40-G Miscellaneous Leachates Procedure - Glass	SOIL - EP202 (solids) Phenoxyacetic acids	SOIL - S-03 15 Metals (NEPM 2013 Suite - incl. Digestion)	SOIL - S-07 TRH/BTEXN/PAH (SIM)	SOIL - W-07 TRH/BTEXN/PAH
EM2512262-036	08-Jul-2025 00:00	CATR02/0.2	✓				✓		
EM2512262-037	08-Jul-2025 00:00	CATR02/0.5	✓	✓			✓		✓
EM2512262-038	08-Jul-2025 00:00	CATR02/0.9	✓	✓			✓		✓
EM2512262-039	08-Jul-2025 00:00	QCP-01	✓				✓	✓	
EM2512262-040	08-Jul-2025 00:00	QCP-02	✓				✓	✓	

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA200G Asbestos Identification in Soils -	SOIL - ED042T Sulfur - Total as S (high temperature furnace	SOIL - EG005C Leachable Metals by ICPAES	SOIL - EK059G (solids) Nitrite plus Nitrate as N (NOx) - soluble by	SOIL - S-18 TRH(C6-C9)/BTEXN
EM2512262-003	07-Jul-2025 00:00	CABH02/0.3 (Ballast)			✓		
EM2512262-006	07-Jul-2025 00:00	TB					✓
EM2512262-007	08-Jul-2025 00:00	CATP01/0.1	✓	✓		✓	
EM2512262-011	08-Jul-2025 00:00	CATP02/0.4	✓				
EM2512262-016	08-Jul-2025 00:00	CATP04/0.4	✓				
EM2512262-018	08-Jul-2025 00:00	CATP05/0.1		✓		✓	
EM2512262-022	08-Jul-2025 00:00	CATP06/0.3	✓				
EM2512262-025	08-Jul-2025 00:00	CATR01-F/0.1	✓		✓		
EM2512262-026	08-Jul-2025 00:00	CATR01-F/0.5	✓		✓		
EM2512262-027	08-Jul-2025 00:00	CATR01-F/1.2	✓		✓		
EM2512262-028	08-Jul-2025 00:00	CATR01-F/1.9	✓		✓		
EM2512262-029	08-Jul-2025 00:00	CATR01-F/2.4	✓		✓		
EM2512262-030	08-Jul-2025 00:00	CATR01-F/3.0	✓				
EM2512262-031	08-Jul-2025 00:00	CATR01-C/0.2	✓				
EM2512262-032	08-Jul-2025 00:00	CATR01-C/0.5	✓				
EM2512262-033	08-Jul-2025 00:00	CATR01-C/0.9	✓				
EM2512262-034	08-Jul-2025 00:00	CATR01-A/0.1	✓		✓		
EM2512262-035	08-Jul-2025 00:00	CATR01-A/0.3	✓		✓		
EM2512262-036	08-Jul-2025 00:00	CATR02/0.2	✓				
EM2512262-037	08-Jul-2025 00:00	CATR02/0.5	✓		✓		
EM2512262-038	08-Jul-2025 00:00	CATR02/0.9	✓		✓		

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EG048G Total Hexavalent Chromium (Alkaline digestion)	SOIL - EG049G-Alk Trivalent Chromium by Discrete Analyser	SOIL - EN33Za TCLP Leachate (ZHE)	SOIL - EP075-TAS Benzo(a)pyrene and other PAHs - Waste	SOIL - P-22 (Melb) Soil Characterisation Package	SOIL - S-04 TRH/BTEXN
EM2512262-008	08-Jul-2025 00:00	CATP01/0.3		✓	✓				
EM2512262-011	08-Jul-2025 00:00	CATP02/0.4		✓	✓			✓	
EM2512262-014	08-Jul-2025 00:00	CATP03/0.7		✓	✓				
EM2512262-016	08-Jul-2025 00:00	CATP04/0.4		✓	✓				
EM2512262-019	08-Jul-2025 00:00	CATP05/0.4		✓	✓				
EM2512262-022	08-Jul-2025 00:00	CATP06/0.3		✓	✓			✓	
EM2512262-024	08-Jul-2025 00:00	CATP0.6/0.7	✓						
EM2512262-025	08-Jul-2025 00:00	CATR01-F/0.1		✓	✓	✓	✓		✓
EM2512262-026	08-Jul-2025 00:00	CATR01-F/0.5		✓	✓	✓	✓		✓
EM2512262-027	08-Jul-2025 00:00	CATR01-F/1.2		✓	✓	✓	✓		✓
EM2512262-028	08-Jul-2025 00:00	CATR01-F/1.9		✓	✓	✓	✓		✓
EM2512262-029	08-Jul-2025 00:00	CATR01-F/2.4		✓	✓	✓	✓		✓
EM2512262-030	08-Jul-2025 00:00	CATR01-F/3.0		✓	✓		✓		✓
EM2512262-031	08-Jul-2025 00:00	CATR01-C/0.2		✓	✓		✓		✓
EM2512262-032	08-Jul-2025 00:00	CATR01-C/0.5		✓	✓		✓		✓
EM2512262-033	08-Jul-2025 00:00	CATR01-C/0.9		✓	✓		✓		✓
EM2512262-034	08-Jul-2025 00:00	CATR01-A/0.1		✓	✓	✓	✓		✓
EM2512262-035	08-Jul-2025 00:00	CATR01-A/0.3		✓	✓	✓	✓		✓
EM2512262-036	08-Jul-2025 00:00	CATR02/0.2		✓	✓		✓		✓
EM2512262-037	08-Jul-2025 00:00	CATR02/0.5		✓	✓	✓	✓		✓
EM2512262-038	08-Jul-2025 00:00	CATR02/0.9		✓	✓	✓	✓		✓

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EN33a-G TCLP Leachate - Glass Leaching Vessel
EM2512262-025	08-Jul-2025 00:00	CATR01-F/0.1	✓
EM2512262-026	08-Jul-2025 00:00	CATR01-F/0.5	✓
EM2512262-027	08-Jul-2025 00:00	CATR01-F/1.2	✓
EM2512262-028	08-Jul-2025 00:00	CATR01-F/1.9	✓
EM2512262-029	08-Jul-2025 00:00	CATR01-F/2.4	✓
EM2512262-034	08-Jul-2025 00:00	CATR01-A/0.1	✓
EM2512262-035	08-Jul-2025 00:00	CATR01-A/0.3	✓
EM2512262-037	08-Jul-2025 00:00	CATR02/0.5	✓

			SOIL - EN33a-G TCLP Leachate - Glass Leaching Vessel
EM2512262-038	08-Jul-2025 00:00	CATR02/0.9	✓

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - W-03T 15 Metals (Total) (NEPM)	WATER - W-07 TRH/BTEXN/PAH
EM2512262-005	07-Jul-2025 00:00	QCR-01	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ALL ACCOUNTS

- A4 - AU Tax Invoice (INV)	Email	accounts@pittsh.com.au

Eduardo Pereira Maes

- *AU Certificate of Analysis - NATA (COA)	Email	epereiramaes@pittsh.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epereiramaes@pittsh.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epereiramaes@pittsh.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epereiramaes@pittsh.com.au
- A4 - AU Tax Invoice (INV)	Email	epereiramaes@pittsh.com.au
- Attachment - Report (SUBCO)	Email	epereiramaes@pittsh.com.au
- Chain of Custody (CoC) (COC)	Email	epereiramaes@pittsh.com.au
- EDI Format - ENMRG (ENMRG)	Email	epereiramaes@pittsh.com.au
- EDI Format - ESDAT (ESDAT)	Email	epereiramaes@pittsh.com.au

KIERAN RICHARDS

- *AU Certificate of Analysis - NATA (COA)	Email	krichards@pittsh.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	krichards@pittsh.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	krichards@pittsh.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	krichards@pittsh.com.au
- Attachment - Report (SUBCO)	Email	krichards@pittsh.com.au
- Chain of Custody (CoC) (COC)	Email	krichards@pittsh.com.au
- EDI Format - ENMRG (ENMRG)	Email	krichards@pittsh.com.au
- EDI Format - ESDAT (ESDAT)	Email	krichards@pittsh.com.au

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry / Biology).

(SOIL) ED042T: Total Sulfur by LECO

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry / Biology).

(SOIL) EA150: Soil Classification based on Particle Size

(SOIL) EA152: Soil Particle Density

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry / Biology).

(SOIL) EP202A: Phenoxyacetic Acid Herbicides by LCMS

QUALITY CONTROL REPORT

Work Order	: **EM2512262**	Page	: 1 of 30
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: Mr Eduardo Pereira Maes	Contact	: Hannah White
Address	: 199 MACQUARIE STREET HOBART 7001	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 0362101400	Telephone	: +61-3-8549 9600
Project	: Cadbury ESA	Date Samples Received	: 09-Jul-2025
Order number	: P.23.1303	Date Analysis Commenced	: 10-Jul-2025
C-O-C number	: ----	Issue Date	: 22-Jul-2025
Sampler	: KIERAN RICHARDS		
Site	: ----		
Quote number	: EM25PITSHE0014		
No. of samples received	: 40		
No. of samples analysed	: 39		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Aleksandar Vujkovic	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Jarwis Nheu	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
MINNIE TRAN	Approved Asbestos Identifier	Melbourne Asbestos, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Satishkumar Trivedi	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Tahlia Freeman	Instrument Operator	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6722268)									
EM2512262-001	CABH01/0.3	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	40	40	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	6	0.0	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	4	4	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	22	20	11.1	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	13	14	8.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	22	23	6.3	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	8760	9940	12.6	0% - 20%
EM2512262-013	CATP03/0.2	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	<10	10	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	8	27.9	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6722268) - continued									
EM2512262-013	CATP03/0.2	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	16	18	15.1	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	20	23	14.2	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	5610	6690	17.5	0% - 20%
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6722270)									
EM2512262-025	CATR01-F/0.1	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	30	20	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	8	0.0	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	5	5	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	7	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	11	8	38.3	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	15	16	11.1	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	114	124	9.1	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	20	18	5.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	73	71	2.2	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	7500	7660	2.2	0% - 20%
EM2512262-034	CATR01-A/0.1	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	60	40	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	12	20.4	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	6	6	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	10	20.2	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	88	88	0.0	0% - 50%
		EG005T: Copper	7440-50-8	5	mg/kg	26	26	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	28	27	5.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	166	158	5.2	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	23	26	11.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	134	136	1.9	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6722270) - continued									
EM2512262-034	CATR01-A/0.1	EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 6718981)									
EM2512262-011	CATP02/0.4	EA001: pH (CaCl2)	----	0.1	pH Unit	5.1	5.1	0.0	0% - 20%
EM2512343-066	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	6.8	6.8	0.0	0% - 20%
EA002-AD: pH (Soils) dried at 40°C (QC Lot: 6720660)									
EM2512262-011	CATP02/0.4	EA002-AD: pH Value	----	0.1	pH Unit	5.6	5.5	0.0	0% - 20%
EA010-AD: Conductivity (Soils) dried at 40°C (QC Lot: 6720659)									
EM2512262-011	CATP02/0.4	EA010-AD: Electrical Conductivity @ 25°C	----	1	µS/cm	21	22	0.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6724331)									
EM2512262-008	CATP01/0.3	EA055: Moisture Content	----	0.1 (1.0)*	%	8.5	11.8	32.3	0% - 50%
EM2512262-023	CATP06/0.5	EA055: Moisture Content	----	0.1 (1.0)*	%	24.4	25.2	3.3	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6724332)									
EM2512262-034	CATR01-A/0.1	EA055: Moisture Content	----	0.1 (1.0)*	%	28.6	32.5	12.7	0% - 20%
EM2512612-005	Anonymous	EA055: Moisture Content	----	0.1	%	36.5	38.4	5.1	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6724334)									
EM2512262-006	TB	EA055: Moisture Content	----	0.1 (1.0)*	%	<1.0	<1.0	0.0	No Limit
EM2512565-020	Anonymous	EA055: Moisture Content	----	0.1	%	19.1	20.0	4.6	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6725021)									
EM2512262-001	CABH01/0.3	EA055: Moisture Content	----	0.1 (1.0)*	%	3.0	2.8	6.8	No Limit
EM2512313-001	Anonymous	EA055: Moisture Content	----	0.1	%	32.0	34.0	6.4	0% - 20%
ED007: Exchangeable Cations (QC Lot: 6720664)									
EM2512262-011	CATP02/0.4	ED007: Exchangeable Calcium	----	0.1	meq/100g	2.0	1.9	6.8	0% - 50%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	0.2	0.2	0.0	No Limit
		ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.0	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	0.1	0.1	0.0	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	2.4	2.2	7.3	0% - 20%
ED042T: Total Sulfur by LECO (QC Lot: 6734951)									
EM2512262-007	CATP01/0.1	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.02	0.02	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6722269)									
EM2512262-001	CABH01/0.3	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2512262-013	CATP03/0.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6722271)									
EM2512262-025	CATR01-F/0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2512262-034	CATR01-A/0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG048: Hexavalent Chromium (Alkaline Digest) (QC Lot: 6724272)									
EM2512262-008	CATP01/0.3	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG048: Hexavalent Chromium (Alkaline Digest) (QC Lot: 6724272) - continued									
EM2512262-028	CATR01-F/1.9	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6728170)									
EM2512262-007	CATP01/0.1	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	2.3	2.1	8.3	0% - 20%
EP004: Organic Matter (QC Lot: 6724267)									
EM2512262-011	CATP02/0.4	EP004: Organic Matter	----	0.5	%	1.1	1.2	0.0	No Limit
		EP004: Total Organic Carbon	----	0.5	%	0.6	0.7	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6722247)									
EM2512262-001	CABH01/0.3	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM2512262-014	CATP03/0.7	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6722247) - continued									
EM2512262-014	CATP03/0.7	EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6722252)									
EM2512262-039	QCP-01	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6722321)									
EM2512262-025	CATR01-F/0.1	EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	<1.0	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6722321) - continued									
EM2512262-035	CATR01-A/0.3	EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	<1.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6710548)									
EM2512262-001	CABH01/0.3	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2512262-014	CATP03/0.7	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6720246)									
EM2512262-007	CATP01/0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2512262-033	CATR01-C/0.9	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6722248)									
EM2512262-001	CABH01/0.3	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2512262-014	CATP03/0.7	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6722251)									
EM2512262-025	CATR01-F/0.1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2512262-039	QCP-01	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6710548)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6710548) - continued									
EM2512262-001	CABH01/0.3	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2512262-014	CATP03/0.7	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6720246)									
EM2512262-007	CATP01/0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2512262-033	CATR01-C/0.9	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6722248)									
EM2512262-001	CABH01/0.3	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2512262-014	CATP03/0.7	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6722251)									
EM2512262-025	CATR01-F/0.1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	120	19.9	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2512262-039	QCP-01	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 6710548)									
EM2512262-001	CABH01/0.3	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EM2512262-014	CATP03/0.7	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP080: BTEXN (QC Lot: 6720246)									
EM2512262-007	CATP01/0.1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 6720246) - continued									
EM2512262-007	CATP01/0.1	EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EM2512262-033	CATR01-C/0.9	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QC Lot: 6716225)									
EP2510948-006	Anonymous	EP202: 4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4-DB	94-82-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Dicamba	1918-00-9	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Mecoprop	93-65-2	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: MCPA	94-74-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4-DP	120-36-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4-D	94-75-7	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Triclopyr	55335-06-3	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4.5-T	93-76-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: MCPB	94-81-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Picloram	1918-02-1	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Clopyralid	1702-17-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Fluroxypyr	69377-81-7	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
EP2510948-033	Anonymous	EP202: 4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4-DB	94-82-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Dicamba	1918-00-9	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Mecoprop	93-65-2	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: MCPA	94-74-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4-DP	120-36-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4-D	94-75-7	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Triclopyr	55335-06-3	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4.5-T	93-76-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: MCPB	94-81-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QC Lot: 6716225) - continued									
EP2510948-033	Anonymous	EP202: Picloram	1918-02-1	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Clopyralid	1702-17-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Fluroxypyr	69377-81-7	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QC Lot: 6721764)									
EB2524126-001	Anonymous	EP202: 4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4-DB	94-82-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Dicamba	1918-00-9	0.02 (0.08)*	mg/kg	1.94	1.97	1.5	0% - 20%
		EP202: Mecoprop	93-65-2	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: MCPA	94-74-6	0.02 (0.08)*	mg/kg	1.52	1.79	16.8	0% - 20%
		EP202: 2.4-DP	120-36-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4-D	94-75-7	0.02 (0.08)*	mg/kg	1.21	1.31	8.0	0% - 50%
		EP202: Triclopyr	55335-06-3	0.02	mg/kg	0.35	0.39	12.6	0% - 50%
		EP202: 2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4.5-T	93-76-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: MCPB	94-81-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Picloram	1918-02-1	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Clopyralid	1702-17-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Fluroxypyr	69377-81-7	0.02	mg/kg	0.03	0.04	0.0	No Limit
EP2511090-002	Anonymous	EP202: 4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4-DB	94-82-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Dicamba	1918-00-9	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Mecoprop	93-65-2	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: MCPA	94-74-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4-DP	120-36-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4-D	94-75-7	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Triclopyr	55335-06-3	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: 2.4.5-T	93-76-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: MCPB	94-81-5	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Picloram	1918-02-1	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Clopyralid	1702-17-6	0.02	mg/kg	<0.02	<0.02	0.0	No Limit
		EP202: Fluroxypyr	69377-81-7	0.02	mg/kg	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)C: Leachable Metals by ICPAES (QC Lot: 6716249)									
EM2512262-025	CATR01-F/0.1	EG005C: Beryllium	7440-41-7	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)C: Leachable Metals by ICPAES (QC Lot: 6716249) - continued									
EM2512262-025	CATR01-F/0.1	EG005C: Selenium	7782-49-2	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Barium	7440-39-3	0.1	mg/L	0.1	<0.1	0.0	No Limit
		EG005C: Boron	7440-42-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Chromium	7440-47-3	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Cobalt	7440-48-4	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Copper	7440-50-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Manganese	7439-96-5	0.1	mg/L	0.2	0.1	0.0	No Limit
		EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Vanadium	7440-62-2	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Zinc	7440-66-6	0.1	mg/L	0.4	0.3	38.4	No Limit
EG005(ED093)C: Leachable Metals by ICPAES (QC Lot: 6720384)									
EM2512262-003	CABH02/0.3 (Ballast)	EG005C: Beryllium	7440-41-7	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG005C: Selenium	7782-49-2	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Barium	7440-39-3	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Boron	7440-42-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Chromium	7440-47-3	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Cobalt	7440-48-4	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Copper	7440-50-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Manganese	7439-96-5	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Vanadium	7440-62-2	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Zinc	7440-66-6	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EM2512481-001	Anonymous	EG005C: Beryllium	7440-41-7	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG005C: Selenium	7782-49-2	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Barium	7440-39-3	0.1	mg/L	0.5	0.5	0.0	No Limit
		EG005C: Boron	7440-42-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Chromium	7440-47-3	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Cobalt	7440-48-4	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Copper	7440-50-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Manganese	7439-96-5	0.1	mg/L	1.3	1.3	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)C: Leachable Metals by ICPAES (QC Lot: 6720384) - continued									
EM2512481-001	Anonymous	EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Vanadium	7440-62-2	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Zinc	7440-66-6	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 6711182)									
EM2512259-003	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Barium	7440-39-3	0.001	mg/L	0.007	0.007	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.006	0.006	0.0	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	<0.001	68.9	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.002	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.052	0.045	12.8	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM2512312-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001 (0.0021)*	mg/L	<0.0021	<0.0021	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001 (0.021) *	mg/L	<0.021	<0.021	0.0	No Limit
		EG020A-T: Beryllium	7440-41-7	0.001 (0.021) *	mg/L	<0.021	<0.021	0.0	No Limit
		EG020A-T: Barium	7440-39-3	0.001 (0.021) *	mg/L	0.591	0.566	4.3	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001 (0.021) *	mg/L	0.025	0.024	0.0	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001 (0.021) *	mg/L	0.031	0.032	5.2	No Limit
		EG020A-T: Copper	7440-50-8	0.001 (0.021) *	mg/L	1.31	1.22	6.9	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001 (0.021) *	mg/L	0.026	0.025	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001 (0.021) *	mg/L	11.1	11.3	2.5	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001 (0.021) *	mg/L	0.046	0.045	2.6	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020T: Total Metals by ICP-MS (QC Lot: 6711182) - continued									
EM2512312-001	Anonymous	EG020A-T: Zinc	7440-66-6	0.005 (0.105) *	mg/L	0.530	0.520	2.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01 (0.21)*	mg/L	<0.21	<0.21	0.0	No Limit
		EG020A-T: Vanadium	7440-62-2	0.01 (0.21)*	mg/L	<0.21	<0.21	0.0	No Limit
		EG020A-T: Boron	7440-42-8	0.05 (0.21)*	mg/L	7.43	7.33	1.4	0% - 20%
EG035C: Leachable Mercury by FIMS (QC Lot: 6716165)									
EM2512262-025	CATR01-F/0.1	EG035C: Mercury	7439-97-6	0.0001 (0.0010)*	mg/L	<0.0010	<0.0010	0.0	No Limit
EM2512390-009	Anonymous	EG035C: Mercury	7439-97-6	0.0001 (0.0010)*	mg/L	0.112	0.111	0.9	0% - 20%
EG035C: Leachable Mercury by FIMS (QC Lot: 6718807)									
EM2512262-003	CABH02/0.3 (Ballast)	EG035C: Mercury	7439-97-6	0.0001 (0.0010)*	mg/L	<0.0010	<0.0010	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6709786)									
EM2512262-005	QCR-01	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP071: Total Petroleum Hydrocarbons (QC Lot: 6718735)									
EM2512262-003	CABH02/0.3 (Ballast)	EP071-SV: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071-SV: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071-SV: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6718735)									
EM2512262-003	CABH02/0.3 (Ballast)	EP071-SV: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071-SV: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071-SV: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6709477)									
EM2512256-001	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6709477) - continued									
EM2512256-001	Anonymous	EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6715913)									
EM2512262-025	CATR01-F/0.1	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6718736)									
EM2512262-003	CABH02/0.3 (Ballast)	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 6718736) - continued									
EM2512262-003	CABH02/0.3 (Ballast)	EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6709478)									
EM2512256-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	41900	# 34100	20.5	0% - 20%
		EP071: C10 - C14 Fraction	----	50	µg/L	220	160	35.5	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	30000	# 24300	21.0	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6709735)									
EM2512262-005	QCR-01	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6715914)									
EM2512262-025	CATR01-F/0.1	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6717751)									
EM2512262-025	CATR01-F/0.1	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6709478)									
EM2512256-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	360	280	26.8	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	65500	# 53200	20.7	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	µg/L	11700	9610	19.9	0% - 20%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6709735)									
EM2512262-005	QCR-01	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6715914)									
EM2512262-025	CATR01-F/0.1	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6717751)									
EM2512262-025	CATR01-F/0.1	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6709735)									
EM2512262-005	QCR-01	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP080: BTEXN (QC Lot: 6717751)									
EM2512262-025	CATR01-F/0.1	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 6717751) - continued									
EM2512262-025	CATR01-F/0.1	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6722268)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	87.1	70.0	130
EG005T: Barium	7440-39-3	10	mg/kg	<10	99.3 mg/kg	96.7	70.0	130
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.67 mg/kg	94.0	70.0	130
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	54.9	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	99.9	70.0	130
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	11.2 mg/kg	90.7	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	93.6	70.0	130
EG005T: Iron	7439-89-6	50	mg/kg	<50	33227 mg/kg	106	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	87.1	70.0	130
EG005T: Manganese	7439-96-5	5	mg/kg	<5	590 mg/kg	92.6	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	90.1	70.0	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	61.3 mg/kg	94.5	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	74.4	70.0	130
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6722270)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	91.7	70.0	130
EG005T: Barium	7440-39-3	10	mg/kg	<10	99.3 mg/kg	95.1	70.0	130
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.67 mg/kg	89.7	70.0	130
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	54.9	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	102	70.0	130
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	11.2 mg/kg	87.8	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	87.7	70.0	130
EG005T: Iron	7439-89-6	50	mg/kg	<50	33227 mg/kg	105	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	84.6	70.0	130
EG005T: Manganese	7439-96-5	5	mg/kg	<5	590 mg/kg	93.6	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	91.7	70.0	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	61.3 mg/kg	93.9	70.0	130

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6722270) - continued								
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	74.2	70.0	130
EA001: pH in soil using 0.01M CaCl extract (QCLot: 6718981)								
EA001: pH (CaCl2)	----	----	pH Unit	----	4 pH Unit	99.2	98.8	101
				----	7 pH Unit	99.8	99.3	101
EA002-AD: pH (Soils) dried at 40°C (QCLot: 6720660)								
EA002-AD: pH Value	----	----	pH Unit	----	4 pH Unit	99.0	98.8	101
				----	7 pH Unit	99.8	99.3	101
EA010-AD: Conductivity (Soils) dried at 40°C (QCLot: 6720659)								
EA010-AD: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1413 µS/cm	102	90.0	110
ED007: Exchangeable Cations (QCLot: 6720664)								
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	24.13 meq/100g	89.9	80.0	130
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.96 meq/100g	88.8	72.2	130
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	1.01 meq/100g	103	77.4	130
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.86 meq/100g	114	89.2	130
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
ED042T: Total Sulfur by LECO (QCLot: 6734951)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	0.31 %	96.1	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6722269)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	93.0	69.0	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6722271)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	86.7	69.0	128
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 6724272)								
EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	20 mg/kg	71.3	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6728170)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	93.7	89.5	119
EP004: Organic Matter (QCLot: 6724267)								
EP004: Organic Matter	----	0.5	%	<0.5	77 %	72.3	70.0	130
EP004: Total Organic Carbon	----	0.5	%	<0.5	43.5 %	74.2	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6722247)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	90.8	85.7	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	87.2	81.0	123
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	91.5	83.6	120
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	90.6	81.3	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	90.0	79.4	123

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6722247) - continued								
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	86.0	81.7	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	92.0	78.3	124
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	93.9	79.9	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	92.6	76.9	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	104	80.9	130
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	91.6	70.0	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	96.6	80.4	130
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	82.1	70.2	123
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	83.8	67.9	122
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	84.1	65.8	123
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	83.8	65.8	127
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6722252)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	104	85.7	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	101	81.0	123
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	103	83.6	120
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	101	81.3	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	104	79.4	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	104	81.7	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	103	78.3	124
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	104	79.9	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	102	76.9	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	107	80.9	130
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	98.8	70.0	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	104	80.4	130
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	98.8	70.2	123
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	96.5	67.9	122
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	96.3	65.8	123
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	99.7	65.8	127
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6722321)								
EP075-TAS: Pyrene	129-00-0	0.5	mg/kg	<0.5	2 mg/kg	93.4	75.4	130
EP075-TAS: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	2 mg/kg	93.6	73.3	130
EP075-TAS: Naphthalene	91-20-3	0.5	mg/kg	<0.5	2 mg/kg	91.2	73.0	131
EP075-TAS: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	2 mg/kg	96.2	72.1	134

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6722321) - continued								
EP075-TAS: Fluorene	86-73-7	0.5	mg/kg	<0.5	2 mg/kg	92.6	74.4	131
EP075-TAS: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	2 mg/kg	92.9	75.3	132
EP075-TAS: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	2 mg/kg	96.6	72.9	135
EP075-TAS: Chrysene	218-01-9	0.5	mg/kg	<0.5	2 mg/kg	97.2	75.0	133
EP075-TAS: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	2 mg/kg	97.1	71.3	134
EP075-TAS: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1.0	4 mg/kg	93.6	75.8	133
EP075-TAS: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	2 mg/kg	93.3	69.6	133
EP075-TAS: Anthracene	120-12-7	0.5	mg/kg	<0.5	2 mg/kg	94.3	78.4	127
EP075-TAS: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	2 mg/kg	92.4	72.0	135
EP075-TAS: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	2 mg/kg	98.6	76.3	130
EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	2 mg/kg	94.5	77.5	134
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6710548)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	87.2	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6720246)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	91.0	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6722248)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	810 mg/kg	100	80.0	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2880 mg/kg	97.7	80.0	120
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1460 mg/kg	96.0	80.0	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6722251)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	810 mg/kg	95.6	80.0	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2880 mg/kg	95.6	80.0	120
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1460 mg/kg	97.3	80.0	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6710548)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	85.0	59.3	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6720246)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	89.1	59.3	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6722248)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1120 mg/kg	100	80.0	120
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3800 mg/kg	96.7	80.0	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	260 mg/kg	110	80.0	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6722251)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1120 mg/kg	95.3	80.0	120

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6722251) - continued								
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3800 mg/kg	95.9	80.0	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	260 mg/kg	97.8	80.0	120
EP080: BTEXN (QCLot: 6710548)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	82.9	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	87.2	65.8	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	85.8	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	89.1	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	91.2	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	92.8	61.8	123
EP080: BTEXN (QCLot: 6720246)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	85.0	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	89.7	65.8	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	88.8	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	93.7	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	92.8	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	102	61.8	123
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 6716225)								
EP202: 4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.02	0.1 mg/kg	65.3	54.4	128
EP202: 2.4-DB	94-82-6	0.02	mg/kg	<0.02	0.1 mg/kg	60.0	45.5	130
EP202: Dicamba	1918-00-9	0.02	mg/kg	<0.02	0.1 mg/kg	72.3	51.7	135
EP202: Mecoprop	93-65-2	0.02	mg/kg	<0.02	0.1 mg/kg	68.8	60.0	130
EP202: MCPA	94-74-6	0.02	mg/kg	<0.02	0.1 mg/kg	72.3	56.8	131
EP202: 2.4-DP	120-36-5	0.02	mg/kg	<0.02	0.1 mg/kg	62.0	50.0	141
EP202: 2.4-D	94-75-7	0.02	mg/kg	<0.02	0.1 mg/kg	70.5	68.5	131
EP202: Triclopyr	55335-06-3	0.02	mg/kg	<0.02	0.1 mg/kg	67.7	50.8	141
EP202: 2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.02	0.1 mg/kg	73.3	40.8	126
EP202: 2.4.5-T	93-76-5	0.02	mg/kg	<0.02	0.1 mg/kg	70.8	57.4	139
EP202: MCPB	94-81-5	0.02	mg/kg	<0.02	0.1 mg/kg	62.1	38.9	137
EP202: Picloram	1918-02-1	0.02	mg/kg	<0.02	0.1 mg/kg	75.6	48.7	129
EP202: Clopyralid	1702-17-6	0.02	mg/kg	<0.02	0.1 mg/kg	75.2	49.4	106
EP202: Fluroxypyr	69377-81-7	0.02	mg/kg	<0.02	0.1 mg/kg	73.6	53.2	128
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 6721764)								
EP202: 4-Chlorophenoxy acetic acid	122-88-3	0.02	mg/kg	<0.02	0.1 mg/kg	72.4	54.4	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 6721764) - continued								
EP202: 2.4-DB	94-82-6	0.02	mg/kg	<0.02	0.1 mg/kg	74.2	45.5	130
EP202: Dicamba	1918-00-9	0.02	mg/kg	<0.02	0.1 mg/kg	67.7	51.7	135
EP202: Mecoprop	93-65-2	0.02	mg/kg	<0.02	0.1 mg/kg	75.7	60.0	130
EP202: MCPA	94-74-6	0.02	mg/kg	<0.02	0.1 mg/kg	79.0	56.8	131
EP202: 2.4-DP	120-36-5	0.02	mg/kg	<0.02	0.1 mg/kg	63.5	50.0	141
EP202: 2.4-D	94-75-7	0.02	mg/kg	<0.02	0.1 mg/kg	77.1	68.5	131
EP202: Triclopyr	55335-06-3	0.02	mg/kg	<0.02	0.1 mg/kg	65.7	50.8	141
EP202: 2.4.5-TP (Silvex)	93-72-1	0.02	mg/kg	<0.02	0.1 mg/kg	66.3	40.8	126
EP202: 2.4.5-T	93-76-5	0.02	mg/kg	<0.02	0.1 mg/kg	73.8	57.4	139
EP202: MCPB	94-81-5	0.02	mg/kg	<0.02	0.1 mg/kg	65.9	38.9	137
EP202: Picloram	1918-02-1	0.02	mg/kg	<0.02	0.1 mg/kg	62.1	48.7	129
EP202: Clopyralid	1702-17-6	0.02	mg/kg	<0.02	0.1 mg/kg	71.2	49.4	106
EP202: Fluroxypyr	69377-81-7	0.02	mg/kg	<0.02	0.1 mg/kg	74.8	53.2	128

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 6716249)								
EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	1 mg/L	101	80.0	120
EG005C: Barium	7440-39-3	0.1	mg/L	<0.1	1 mg/L	99.3	80.0	120
EG005C: Beryllium	7440-41-7	0.05	mg/L	<0.05	1 mg/L	90.9	80.0	120
EG005C: Boron	7440-42-8	0.1	mg/L	<0.1	5 mg/L	98.3	80.0	120
EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	1 mg/L	84.3	80.0	120
EG005C: Chromium	7440-47-3	0.1	mg/L	<0.1	1 mg/L	88.6	80.0	120
EG005C: Cobalt	7440-48-4	0.1	mg/L	<0.1	1 mg/L	86.6	80.0	120
EG005C: Copper	7440-50-8	0.1	mg/L	<0.1	1 mg/L	105	80.0	120
EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	1 mg/L	83.4	80.0	120
EG005C: Manganese	7439-96-5	0.1	mg/L	<0.1	1 mg/L	81.4	80.0	120
EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	1 mg/L	85.9	80.0	120
EG005C: Selenium	7782-49-2	0.05	mg/L	<0.05	1 mg/L	93.9	80.0	120
EG005C: Vanadium	7440-62-2	0.1	mg/L	<0.1	1 mg/L	91.4	80.0	120
EG005C: Zinc	7440-66-6	0.1	mg/L	<0.1	1 mg/L	80.3	80.0	120
EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 6720384)								
EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	1 mg/L	109	80.0	120
EG005C: Barium	7440-39-3	0.1	mg/L	<0.1	1 mg/L	106	80.0	120

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 6720384) - continued								
EG005C: Beryllium	7440-41-7	0.05	mg/L	<0.05	1 mg/L	98.5	80.0	120
EG005C: Boron	7440-42-8	0.1	mg/L	<0.1	5 mg/L	105	80.0	120
EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	1 mg/L	90.6	80.0	120
EG005C: Chromium	7440-47-3	0.1	mg/L	<0.1	1 mg/L	96.1	80.0	120
EG005C: Cobalt	7440-48-4	0.1	mg/L	<0.1	1 mg/L	94.1	80.0	120
EG005C: Copper	7440-50-8	0.1	mg/L	<0.1	1 mg/L	112	80.0	120
EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	1 mg/L	92.6	80.0	120
EG005C: Manganese	7439-96-5	0.1	mg/L	<0.1	1 mg/L	89.6	80.0	120
EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	1 mg/L	92.0	80.0	120
EG005C: Selenium	7782-49-2	0.05	mg/L	<0.05	1 mg/L	97.2	80.0	120
EG005C: Vanadium	7440-62-2	0.1	mg/L	<0.1	1 mg/L	101	80.0	120
EG005C: Zinc	7440-66-6	0.1	mg/L	<0.1	1 mg/L	81.0	80.0	120
EG020T: Total Metals by ICP-MS (QCLot: 6711182)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	89.2	110
EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	92.1	86.0	112
EG020A-T: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	102	90.1	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.4	86.4	115
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	100	89.0	112
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	98.8	90.4	113
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.7	88.3	111
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.9	88.3	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.7	89.9	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.9	88.8	113
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	106	89.7	114
EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	102	90.4	114
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	104	90.0	115
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	99.3	89.3	118
EG035C: Leachable Mercury by FIMS (QCLot: 6716165)								
EG035C: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	90.8	72.0	115
EG035C: Leachable Mercury by FIMS (QCLot: 6718807)								
EG035C: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.0	72.0	115
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6709786)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.5	73.4	119
EP071: Total Petroleum Hydrocarbons (QCLot: 6718735)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP071: Total Petroleum Hydrocarbons (QCLot: 6718735) - continued								
EP071-SV: C10 - C14 Fraction	----	50	µg/L	<50	4421 µg/L	79.3	47.2	122
EP071-SV: C15 - C28 Fraction	----	100	µg/L	<100	15219 µg/L	88.8	52.9	131
EP071-SV: C29 - C36 Fraction	----	50	µg/L	<50	7904 µg/L	89.1	50.4	127
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6718735)								
EP071-SV: >C10 - C16 Fraction	----	100	µg/L	<100	6085 µg/L	80.6	49.1	125
EP071-SV: >C16 - C34 Fraction	----	100	µg/L	<100	20300 µg/L	89.4	51.6	128
EP071-SV: >C34 - C40 Fraction	----	100	µg/L	<100	1456 µg/L	93.6	47.2	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6709477)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	86.6	42.8	114
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	89.0	48.6	119
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	93.0	47.0	117
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	107	49.5	119
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	96.0	49.4	121
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	92.9	48.4	122
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	75.5	50.3	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	76.1	50.0	126
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	95.0	49.4	127
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	97.6	48.7	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	100	54.5	134
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	80.9	56.1	134
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	90.2	55.6	135
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	92.7	54.4	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	94.7	54.5	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	75.0	54.4	126
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6715913)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	77.5	42.8	114
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	90.3	48.6	119
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	92.5	47.0	117
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	85.8	49.5	119
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	99.8	49.4	121
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	96.4	48.4	122
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	111	50.3	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	110	50.0	126

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6715913) - continued								
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	99.7	49.4	127
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	97.9	48.7	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	97.7	54.5	134
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	94.9	56.1	134
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	88.7	55.6	135
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	88.1	54.4	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	89.4	54.5	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	101	54.4	126
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6718736)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	71.2	42.8	114
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	71.7	48.6	119
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	74.6	47.0	117
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	78.8	49.5	119
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	75.8	49.4	121
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	72.6	48.4	122
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	54.7	50.3	124
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	53.2	50.0	126
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	70.7	49.4	127
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	71.4	48.7	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	77.5	54.5	134
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	84.5	56.1	134
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	78.5	55.6	135
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	59.8	54.4	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	63.3	54.5	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	63.4	54.4	126
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6709478)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4421 µg/L	61.0	47.2	122
EP071: C15 - C28 Fraction	----	100	µg/L	<100	15219 µg/L	65.5	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	7904 µg/L	64.8	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6709735)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	116	66.2	134
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6715914)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4421 µg/L	70.8	47.2	122

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6715914) - continued								
EP071: C15 - C28 Fraction	----	100	µg/L	<100	15219 µg/L	77.7	52.9	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	7904 µg/L	76.2	50.4	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6717751)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	112	66.2	134
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6709478)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6085 µg/L	61.5	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	20300 µg/L	64.9	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1456 µg/L	62.7	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6709735)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	114	66.2	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6715914)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6085 µg/L	71.5	49.1	125
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	20300 µg/L	77.7	51.6	128
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1456 µg/L	73.1	47.2	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6717751)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	109	66.2	132
EP080: BTEXN (QCLot: 6709735)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	106	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	113	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	115	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	121	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	117	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	121	68.3	131
EP080: BTEXN (QCLot: 6717751)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	106	68.8	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	109	72.9	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	106	71.7	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	114	72.3	136
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	114	75.9	134
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	88.2	68.3	131

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6722268)							
EM2512262-002	CABH02/0.3	EG005T: Arsenic	7440-38-2	50 mg/kg	94.1	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.3	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	94.2	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	97.7	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	96.1	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	92.6	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	93.7	80.0	120
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6722270)							
EM2512262-026	CATR01-F/0.5	EG005T: Arsenic	7440-38-2	50 mg/kg	101	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	87.6	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	104	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	108	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	99.7	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	109	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6722269)							
EM2512262-002	CABH02/0.3	EG035T: Mercury	7439-97-6	0.5 mg/kg	100	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6722271)							
EM2512262-026	CATR01-F/0.5	EG035T: Mercury	7439-97-6	0.5 mg/kg	100.0	70.0	130
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 6724272)							
EM2512262-011	CATP02/0.4	EG048G: Hexavalent Chromium	18540-29-9	20 mg/kg	# 56.7	58.0	114
EM2512262-011	CATP02/0.4	EG048G: Hexavalent Chromium	18540-29-9	20 mg/kg	64.7	58.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6728170)							
EM2512262-018	CATP05/0.1	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	100	70.0	130
EP004: Organic Matter (QCLot: 6724267)							
EM2512262-022	CATP06/0.3	EP004: Organic Matter	----	4.94 %	81.4	70.0	120
		EP004: Total Organic Carbon	----	2.87 %	81.2	70.0	120
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6722247)							
EM2512262-002	CABH02/0.3	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	95.1	77.2	116
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	94.3	65.5	136
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6722252)							
EM2512262-040	QCP-02	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	87.2	77.2	116
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	89.4	65.5	136
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6722321)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 6722321) - continued							
EM2512262-026	CATR01-F/0.5	EP075-TAS: Pyrene	129-00-0	3 mg/kg	97.0	37.8	152
		EP075-TAS: Acenaphthene	83-32-9	3 mg/kg	101	42.6	138
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6710548)							
EM2512262-002	CABH02/0.3	EP080: C6 - C9 Fraction	----	28 mg/kg	67.2	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6720246)							
EM2512262-018	CATP05/0.1	EP080: C6 - C9 Fraction	----	28 mg/kg	73.2	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6722248)							
EM2512262-004	CABH02/0.4	EP071: C10 - C14 Fraction	----	810 mg/kg	102	70.0	130
		EP071: C15 - C28 Fraction	----	2880 mg/kg	98.5	70.0	130
		EP071: C29 - C36 Fraction	----	1460 mg/kg	96.5	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6722251)							
EM2512262-026	CATR01-F/0.5	EP071: C10 - C14 Fraction	----	810 mg/kg	98.8	70.0	130
		EP071: C15 - C28 Fraction	----	2880 mg/kg	98.9	70.0	130
		EP071: C29 - C36 Fraction	----	1460 mg/kg	100	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6710548)							
EM2512262-002	CABH02/0.3	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	67.1	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6720246)							
EM2512262-018	CATP05/0.1	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	70.7	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6722248)							
EM2512262-004	CABH02/0.4	EP071: >C10 - C16 Fraction	----	1120 mg/kg	101	70.0	130
		EP071: >C16 - C34 Fraction	----	3800 mg/kg	97.4	70.0	130
		EP071: >C34 - C40 Fraction	----	260 mg/kg	111	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6722251)							
EM2512262-026	CATR01-F/0.5	EP071: >C10 - C16 Fraction	----	1120 mg/kg	98.5	70.0	130
		EP071: >C16 - C34 Fraction	----	3800 mg/kg	99.1	70.0	130
		EP071: >C34 - C40 Fraction	----	260 mg/kg	102	70.0	130
EP080: BTEXN (QCLot: 6710548)							
EM2512262-002	CABH02/0.3	EP080: Benzene	71-43-2	2 mg/kg	92.3	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	95.2	57.1	131
EP080: BTEXN (QCLot: 6720246)							
EM2512262-018	CATP05/0.1	EP080: Benzene	71-43-2	2 mg/kg	80.0	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	82.8	57.1	131
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 6716225)							
EP2510948-006	Anonymous	EP202: Mecoprop	93-65-2	0.1 mg/kg	69.3	60.0	140
		EP202: MCPA	94-74-6	0.1 mg/kg	69.1	57.0	143

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 6716225) - continued							
EP2510948-006	Anonymous	EP202: 2.4-D	94-75-7	0.1 mg/kg	70.8	68.0	139
		EP202: Triclopyr	55335-06-3	0.1 mg/kg	65.8	51.0	145
		EP202: 2.4.5-T	93-76-5	0.1 mg/kg	68.6	57.0	142
		EP202: Picloram	1918-02-1	0.1 mg/kg	67.5	49.0	138
		EP202: Clopyralid	1702-17-6	0.1 mg/kg	69.0	49.0	149
EP202A: Phenoxyacetic Acid Herbicides by LCMS (QCLot: 6721764)							
EB2524126-001	Anonymous	EP202: Mecoprop	93-65-2	0.1 mg/kg	69.7	60.0	140
		EP202: MCPA	94-74-6	0.1 mg/kg	# Not Determined	57.0	143
		EP202: 2.4-D	94-75-7	0.1 mg/kg	# Not Determined	68.0	139
		EP202: Triclopyr	55335-06-3	0.1 mg/kg	126	51.0	145
		EP202: 2.4.5-T	93-76-5	0.1 mg/kg	73.2	57.0	142
		EP202: Picloram	1918-02-1	0.1 mg/kg	# 44.5	49.0	138
		EP202: Clopyralid	1702-17-6	0.1 mg/kg	# 25.0	49.0	149

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 6716249)							
EM2512262-026	CATR01-F/0.5	EG005C: Arsenic	7440-38-2	1 mg/L	101	80.0	120
		EG005C: Barium	7440-39-3	1 mg/L	100	80.0	120
		EG005C: Beryllium	7440-41-7	1 mg/L	97.6	80.0	120
		EG005C: Cadmium	7440-43-9	0.25 mg/L	93.5	80.0	120
		EG005C: Chromium	7440-47-3	1 mg/L	93.8	80.0	120
		EG005C: Cobalt	7440-48-4	1 mg/L	93.5	80.0	120
		EG005C: Copper	7440-50-8	1 mg/L	101	80.0	120
		EG005C: Lead	7439-92-1	1 mg/L	92.1	80.0	120
		EG005C: Nickel	7440-02-0	1 mg/L	93.0	80.0	120
		EG005C: Vanadium	7440-62-2	1 mg/L	94.2	80.0	120
		EG005C: Zinc	7440-66-6	1 mg/L	89.7	80.0	120
EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 6720384)							
EM2512393-001	Anonymous	EG005C: Arsenic	7440-38-2	1 mg/L	112	80.0	120
		EG005C: Barium	7440-39-3	1 mg/L	106	80.0	120
		EG005C: Beryllium	7440-41-7	1 mg/L	106	80.0	120
		EG005C: Cadmium	7440-43-9	0.25 mg/L	100	80.0	120
		EG005C: Chromium	7440-47-3	1 mg/L	101	80.0	120
		EG005C: Cobalt	7440-48-4	1 mg/L	100	80.0	120
		EG005C: Copper	7440-50-8	1 mg/L	110	80.0	120

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 6720384) - continued							
EM2512393-001	Anonymous	EG005C: Lead	7439-92-1	1 mg/L	103	80.0	120
		EG005C: Nickel	7440-02-0	1 mg/L	99.3	80.0	120
		EG005C: Vanadium	7440-62-2	1 mg/L	104	80.0	120
		EG005C: Zinc	7440-66-6	1 mg/L	92.7	80.0	120
EG020T: Total Metals by ICP-MS (QCLot: 6711182)							
EM2512259-003	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	103	82.0	123
		EG020A-T: Beryllium	7440-41-7	1 mg/L	104	79.0	126
		EG020A-T: Barium	7440-39-3	1 mg/L	100	80.0	120
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	101	81.8	123
		EG020A-T: Chromium	7440-47-3	1 mg/L	105	78.9	119
		EG020A-T: Cobalt	7440-48-4	1 mg/L	107	80.7	121
		EG020A-T: Copper	7440-50-8	1 mg/L	102	80.4	118
		EG020A-T: Lead	7439-92-1	1 mg/L	108	80.5	121
		EG020A-T: Manganese	7439-96-5	1 mg/L	101	73.0	123
		EG020A-T: Nickel	7440-02-0	1 mg/L	103	80.0	118
		EG020A-T: Vanadium	7440-62-2	1 mg/L	103	81.0	119
		EG020A-T: Zinc	7440-66-6	1 mg/L	104	74.0	120
EG035C: Leachable Mercury by FIMS (QCLot: 6716165)							
EM2512262-026	CATR01-F/0.5	EG035C: Mercury	7439-97-6	0.01 mg/L	95.2	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6709786)							
EM2512291-012	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	103	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6717751)							
EM2512262-026	CATR01-F/0.5	EP080: C6 - C9 Fraction	----	280 µg/L	115	33.9	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6717751)							
EM2512262-026	CATR01-F/0.5	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	97.8	34.0	122
EP080: BTEXN (QCLot: 6717751)							
EM2512262-026	CATR01-F/0.5	EP080: Benzene	71-43-2	20 µg/L	114	56.3	133
		EP080: Toluene	108-88-3	20 µg/L	110	60.4	132

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2512262**	Page	: 1 of 24
Client	: **PITT & SHERRY (OPERATIONS) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: Mr Eduardo Pereira Maes	Telephone	: +61-3-8549 9600
Project	: Cadbury ESA	Date Samples Received	: 09-Jul-2025
Site	: ----	Issue Date	: 22-Jul-2025
Sampler	: KIERAN RICHARDS	No. of samples received	: 40
Order number	: P.23.1303	No. of samples analysed	: 39

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG048: Hexavalent Chromium (Alkaline Digest)	EM2512262--011	CATP02/0.4	**Hexavalent Chromium**	18540-29-9	56.7 %	58.0-114%	**Recovery less than lower data quality objective**
EP202A: Phenoxyacetic Acid Herbicides by LCMS	EB2524126--001	Anonymous	**MCPA**	94-74-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP202A: Phenoxyacetic Acid Herbicides by LCMS	EB2524126--001	Anonymous	**2.4-D**	94-75-7	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP202A: Phenoxyacetic Acid Herbicides by LCMS	EB2524126--001	Anonymous	**Picloram**	1918-02-1	44.5 %	49.0-138%	**Recovery less than lower data quality objective**
EP202A: Phenoxyacetic Acid Herbicides by LCMS	EB2524126--001	Anonymous	**Clopyralid**	1702-17-6	25.0 %	49.0-149%	**Recovery less than lower data quality objective**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP080/071: Total Petroleum Hydrocarbons	EM2512256--001	Anonymous	**C15 - C28 Fraction**	----	20.5 %	0% - 20%	**RPD exceeds LOR based limits**
EP080/071: Total Petroleum Hydrocarbons	EM2512256--001	Anonymous	**C29 - C36 Fraction**	----	21.0 %	0% - 20%	**RPD exceeds LOR based limits**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM2512256--001	Anonymous	**>C16 - C34 Fraction**	----	20.7 %	0% - 20%	**RPD exceeds LOR based limits**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / **Container** / Client Sample ID(s)		*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA002-AD: pH (Soils) dried at 40°C							
Soil Glass Jar - Unpreserved							
CATP02/0.4,	CATP06/0.3	16-Jul-2025	15-Jul-2025	**1**	----	----	----
EA010-AD: Conductivity (Soils) dried at 40°C							
Soil Glass Jar - Unpreserved							
CATP02/0.4,	CATP06/0.3	16-Jul-2025	15-Jul-2025	**1**	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Soil Glass Jar - Unpreserved							
CATP01/0.1,	CATP05/0.1	----	----	----	21-Jul-2025	20-Jul-2025	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP) - Continued						
TRH - Semivolatile Fraction	EP071	2	26	7.69	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Leachable Mercury by FIMS	EG035C	1	21	4.76	5.00	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	26	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	26	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only	EP071-SV	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container / Client Sample ID(s)*		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA001: pH in soil using 0.01M CaCl extract								
Soil Glass Jar - Unpreserved (EA001)								
CATP02/0.4,	CATP06/0.3	**08-Jul-2025**	**15-Jul-2025**	15-Jul-2025	✓	**15-Jul-2025**	15-Jul-2025	✓
EA002-AD: pH (Soils) dried at 40°C								
Soil Glass Jar - Unpreserved (EA002-AD)								
CATP02/0.4,	CATP06/0.3	**08-Jul-2025**	**16-Jul-2025**	15-Jul-2025	×	**16-Jul-2025**	16-Jul-2025	✓
EA010-AD: Conductivity (Soils) dried at 40°C								
Soil Glass Jar - Unpreserved (EA010-AD)								
CATP02/0.4,	CATP06/0.3	**08-Jul-2025**	**16-Jul-2025**	15-Jul-2025	×	**16-Jul-2025**	13-Aug-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
TB	**07-Jul-2025**	**----**	----	----	**16-Jul-2025**	21-Jul-2025	✓
Soil Glass Jar - Unpreserved (EA055)							
CABH01/0.3, CABH02/0.3, CABH02/0.4	**07-Jul-2025**	**----**	----	----	**17-Jul-2025**	21-Jul-2025	✓
Soil Glass Jar - Unpreserved (EA055)							
CATP01/0.3, CATP01/0.4, CATP02/0.4, CATP02/0.8, CATP03/0.7, CATP04/0.4, CATP04/0.7, CATP05/0.4, CATP05/0.8, CATP06/0.3, CATP06/0.5, CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-F/3.0, CATR01-C/0.2, CATR01-C/0.5, QCP-01, CATR01-C/0.9, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.2, CATR02/0.5, QCP-02	**08-Jul-2025**	**----**	----	----	**16-Jul-2025**	22-Jul-2025	✓
Soil Glass Jar - Unpreserved (EA055)							
CATP01/0.1, CATP02/0.1, CATP03/0.2, CATP04/0.2, CATP05/0.1, CATP06/0.1, CATR02/0.9	**08-Jul-2025**	**----**	----	----	**17-Jul-2025**	22-Jul-2025	✓
EA150: Soil Classification based on Particle Size							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA150H)							
CATP02/0.4, CATP06/0.3	**08-Jul-2025**	**----**	----	----	**16-Jul-2025**	04-Jan-2026	✓
EA152: Soil Particle Density							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA152)							
CATP02/0.4, CATP06/0.3	**08-Jul-2025**	**----**	----	----	**16-Jul-2025**	04-Jan-2026	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200)							
CATP02/0.4, CATP04/0.4, CATP06/0.3, CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-F/3.0, CATR01-C/0.2, CATR01-C/0.5, CATR01-C/0.9, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.2, CATR02/0.5, CATR02/0.9	**08-Jul-2025**	**----**	----	**----**	**10-Jul-2025**	04-Jan-2026	✓
Snap Lock Bag - ACM/Asbestos Grab Bag (EA200)							
CATP01/0.1	**08-Jul-2025**	**----**	----	**----**	**14-Jul-2025**	04-Jan-2026	✓
ED006: Exchangeable Cations on Alkaline Soils							
Soil Glass Jar - Unpreserved (ED006)							
CATP06/0.3	**08-Jul-2025**	**15-Jul-2025**	05-Aug-2025	✓	**17-Jul-2025**	05-Aug-2025	✓
ED007: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED007)							
CATP02/0.4, CATP06/0.3	**08-Jul-2025**	**15-Jul-2025**	05-Aug-2025	✓	**17-Jul-2025**	05-Aug-2025	✓
ED008: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED008)							
CATP06/0.3	**08-Jul-2025**	**15-Jul-2025**	05-Aug-2025	✓	**17-Jul-2025**	05-Aug-2025	✓
ED042T: Total Sulfur by LECO							
Pulp Bag (ED042T)							
CATP01/0.1, CATP05/0.1	**08-Jul-2025**	**22-Jul-2025**	04-Jan-2026	✓	**22-Jul-2025**	04-Jan-2026	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
CABH01/0.3, CABH02/0.3, CABH02/0.4	**07-Jul-2025**	**16-Jul-2025**	03-Jan-2026	✓	**17-Jul-2025**	03-Jan-2026	✓
Soil Glass Jar - Unpreserved (EG005T)							
CATP01/0.1, CATP01/0.3, CATP01/0.4, CATP02/0.1, CATP02/0.4, CATP02/0.8, CATP03/0.2, CATP03/0.7, CATP04/0.2, CATP04/0.4, CATP04/0.7, CATP05/0.1, CATP05/0.4, CATP05/0.8, CATP06/0.1, CATP06/0.3, CATP06/0.5, CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-F/3.0, CATR01-C/0.2, CATR01-C/0.5, CATR01-C/0.9, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.2, CATR02/0.5, CATR02/0.9, QCP-01, QCP-02	**08-Jul-2025**	**16-Jul-2025**	04-Jan-2026	✓	**17-Jul-2025**	04-Jan-2026	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
CABH01/0.3, CABH02/0.3, CABH02/0.4	**07-Jul-2025**	**16-Jul-2025**	04-Aug-2025	✓	**18-Jul-2025**	04-Aug-2025	✓
Soil Glass Jar - Unpreserved (EG035T)							
CATP01/0.1, CATP01/0.3, CATP01/0.4, CATP02/0.1, CATP02/0.4, CATP02/0.8, CATP03/0.2, CATP03/0.7, CATP04/0.2, CATP04/0.4, CATP04/0.7, CATP05/0.1, CATP05/0.4, CATP05/0.8, CATP06/0.1, CATP06/0.3, CATP06/0.5, CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-F/3.0, CATR01-C/0.2, CATR01-C/0.5, CATR01-C/0.9, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.2, CATR02/0.5, CATR02/0.9, QCP-01, QCP-02	**08-Jul-2025**	**16-Jul-2025**	05-Aug-2025	✓	**18-Jul-2025**	05-Aug-2025	✓
EG048: Hexavalent Chromium (Alkaline Digest)							
Soil Glass Jar - Unpreserved (EG048G)							
CATP01/0.3, CATP02/0.4, CATP03/0.7, CATP04/0.4, CATP05/0.4, CATP06/0.3, CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-F/3.0, CATR01-C/0.2, CATR01-C/0.5, CATR01-C/0.9, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.2, CATR02/0.5, CATR02/0.9	**08-Jul-2025**	**17-Jul-2025**	05-Aug-2025	✓	**18-Jul-2025**	24-Jul-2025	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK059G)							
CATP01/0.1, CATP05/0.1	**08-Jul-2025**	**18-Jul-2025**	05-Aug-2025	✓	**21-Jul-2025**	20-Jul-2025	×

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EN33: TCLP Leach - Inorganics/Non-Volatile Organics (Glass Vessel)							
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN33a-G)							
CATR01-F/0.1, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.5, CATR02/0.9	**08-Jul-2025**	**10-Jul-2025**	22-Jul-2025	✓	**----**	----	----
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN33a-G)							
CATR01-F/0.5	**08-Jul-2025**	**11-Jul-2025**	22-Jul-2025	✓	**----**	----	----
EN33Z: ZHE TCLP Leach							
ZHE Leach: 14 day HT(e.g. CN, BTEX) (EN33Za)							
CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.5, CATR02/0.9	**08-Jul-2025**	**10-Jul-2025**	22-Jul-2025	✓	**----**	----	----
EN40: Miscellaneous Leachates Procedure - Inorganics/Non-Volatile Organics (Glass Vessel)							
Non-Volatile Leach: 14 day HT(e.g. SV organics) (EN40-G)							
CABH02/0.3 (Ballast)	**07-Jul-2025**	**14-Jul-2025**	21-Jul-2025	✓	**----**	----	----
EP004: Organic Matter							
Soil Glass Jar - Unpreserved (EP004)							
CATP02/0.4, CATP06/0.3	**08-Jul-2025**	**16-Jul-2025**	05-Aug-2025	✓	**18-Jul-2025**	05-Aug-2025	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
CABH01/0.3, CABH02/0.3, CABH02/0.4	**07-Jul-2025**	**16-Jul-2025**	21-Jul-2025	✓	**17-Jul-2025**	25-Aug-2025	✓
Soil Glass Jar - Unpreserved (EP075(SIM))							
CATP01/0.1, CATP01/0.3, CATP01/0.4, CATP02/0.1, CATP02/0.4, CATP02/0.8	**08-Jul-2025**	**16-Jul-2025**	22-Jul-2025	✓	**17-Jul-2025**	25-Aug-2025	✓
Soil Glass Jar - Unpreserved (EP075(SIM))							
CATP03/0.2, CATP03/0.7, CATP04/0.2, CATP04/0.4, CATP04/0.7, CATP05/0.1, CATP05/0.4, CATP05/0.8, CATP06/0.1, CATP06/0.3, CATP06/0.5	**08-Jul-2025**	**16-Jul-2025**	22-Jul-2025	✓	**18-Jul-2025**	25-Aug-2025	✓
Soil Glass Jar - Unpreserved (EP075(SIM))							
QCP-01, QCP-02	**08-Jul-2025**	**17-Jul-2025**	22-Jul-2025	✓	**17-Jul-2025**	26-Aug-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075-TAS) CATR01-F/0.1, CATR01-F/0.5, CATR01-F/2.4	**08-Jul-2025**	**17-Jul-2025**	22-Jul-2025	✓	**17-Jul-2025**	26-Aug-2025	✓
Soil Glass Jar - Unpreserved (EP075-TAS) CATR01-F/1.2, CATR01-F/1.9, CATR01-F/3.0, CATR01-C/0.2, CATR01-C/0.5, CATR01-C/0.9, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.2, CATR02/0.5, CATR02/0.9	**08-Jul-2025**	**17-Jul-2025**	22-Jul-2025	✓	**18-Jul-2025**	26-Aug-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) CABH01/0.3	**07-Jul-2025**	**10-Jul-2025**	21-Jul-2025	✓	**11-Jul-2025**	21-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP080) CABH02/0.3, CABH02/0.4, TB	**07-Jul-2025**	**11-Jul-2025**	21-Jul-2025	✓	**11-Jul-2025**	21-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP071) CABH01/0.3, CABH02/0.3, CABH02/0.4	**07-Jul-2025**	**16-Jul-2025**	21-Jul-2025	✓	**17-Jul-2025**	25-Aug-2025	✓
Soil Glass Jar - Unpreserved (EP080) CATP01/0.3, CATP01/0.4, CATP02/0.1, CATP02/0.4, CATP02/0.8, CATP03/0.2, CATP03/0.7, CATP04/0.2, CATP04/0.4, CATP04/0.7, CATP05/0.4, CATP05/0.8, CATP06/0.1, CATP06/0.3, CATP06/0.5	**08-Jul-2025**	**11-Jul-2025**	22-Jul-2025	✓	**11-Jul-2025**	22-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP080) CATP01/0.1, CATP05/0.1	**08-Jul-2025**	**14-Jul-2025**	22-Jul-2025	✓	**16-Jul-2025**	22-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP080) CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-F/3.0, CATR01-C/0.2, CATR01-C/0.5, CATR01-C/0.9, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.2, CATR02/0.5, CATR02/0.9, QCP-01, QCP-02	**08-Jul-2025**	**16-Jul-2025**	22-Jul-2025	✓	**16-Jul-2025**	22-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP071) CATP01/0.1, CATP01/0.3, CATP01/0.4, CATP02/0.1, CATP02/0.4, CATP02/0.8, CATP03/0.2, CATP03/0.7, CATP04/0.2, CATP04/0.4, CATP04/0.7, CATP05/0.1, CATP05/0.4, CATP05/0.8, CATP06/0.1, CATP06/0.3, CATP06/0.5	**08-Jul-2025**	**16-Jul-2025**	22-Jul-2025	✓	**17-Jul-2025**	25-Aug-2025	✓
Soil Glass Jar - Unpreserved (EP071)							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons - Continued								
CATR01-F/0.1,	CATR01-F/0.5,	**08-Jul-2025**	**17-Jul-2025**	22-Jul-2025	✓	**17-Jul-2025**	26-Aug-2025	✓
CATR01-F/1.2,	CATR01-F/1.9,							
CATR01-F/2.4,	CATR01-F/3.0,							
CATR01-C/0.2,	CATR01-C/0.5,							
CATR01-C/0.9,	CATR01-A/0.1,							
CATR01-A/0.3,	CATR02/0.2,							
CATR02/0.5,	CATR02/0.9,							
QCP-01,	QCP-02							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
CABH01/0.3	**07-Jul-2025**	**10-Jul-2025**	21-Jul-2025	✓	**11-Jul-2025**	21-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP080)							
CABH02/0.3, CABH02/0.4, TB	**07-Jul-2025**	**11-Jul-2025**	21-Jul-2025	✓	**11-Jul-2025**	21-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP071)							
CABH01/0.3, CABH02/0.3, CABH02/0.4	**07-Jul-2025**	**16-Jul-2025**	21-Jul-2025	✓	**17-Jul-2025**	25-Aug-2025	✓
Soil Glass Jar - Unpreserved (EP080)							
CATP01/0.3, CATP01/0.4, CATP02/0.1, CATP02/0.4, CATP02/0.8, CATP03/0.2, CATP03/0.7, CATP04/0.2, CATP04/0.4, CATP04/0.7, CATP05/0.4, CATP05/0.8, CATP06/0.1, CATP06/0.3, CATP06/0.5	**08-Jul-2025**	**11-Jul-2025**	22-Jul-2025	✓	**11-Jul-2025**	22-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP080)							
CATP01/0.1, CATP05/0.1	**08-Jul-2025**	**14-Jul-2025**	22-Jul-2025	✓	**16-Jul-2025**	22-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP080)							
CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-F/3.0, CATR01-C/0.2, CATR01-C/0.5, CATR01-C/0.9, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.2, CATR02/0.5, CATR02/0.9, QCP-01, QCP-02	**08-Jul-2025**	**16-Jul-2025**	22-Jul-2025	✓	**16-Jul-2025**	22-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP071)							
CATP01/0.1, CATP01/0.3, CATP01/0.4, CATP02/0.1, CATP02/0.4, CATP02/0.8, CATP03/0.2, CATP03/0.7, CATP04/0.2, CATP04/0.4, CATP04/0.7, CATP05/0.1, CATP05/0.4, CATP05/0.8, CATP06/0.1, CATP06/0.3, CATP06/0.5	**08-Jul-2025**	**16-Jul-2025**	22-Jul-2025	✓	**17-Jul-2025**	25-Aug-2025	✓
Soil Glass Jar - Unpreserved (EP071)							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued							
CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-F/3.0, CATR01-C/0.2, CATR01-C/0.5, CATR01-C/0.9, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.2, CATR02/0.5, CATR02/0.9, QCP-01, QCP-02	**08-Jul-2025**	**17-Jul-2025**	22-Jul-2025	✓	**17-Jul-2025**	26-Aug-2025	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) CABH01/0.3	**07-Jul-2025**	**10-Jul-2025**	21-Jul-2025	✓	**11-Jul-2025**	21-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP080) CABH02/0.3, CABH02/0.4, TB	**07-Jul-2025**	**11-Jul-2025**	21-Jul-2025	✓	**11-Jul-2025**	21-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP080) CATP01/0.3, CATP01/0.4, CATP02/0.1, CATP02/0.4, CATP02/0.8, CATP03/0.2, CATP03/0.7, CATP04/0.2, CATP04/0.4, CATP04/0.7, CATP05/0.4, CATP05/0.8, CATP06/0.1, CATP06/0.3, CATP06/0.5	**08-Jul-2025**	**11-Jul-2025**	22-Jul-2025	✓	**11-Jul-2025**	22-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP080) CATP01/0.1, CATP05/0.1	**08-Jul-2025**	**14-Jul-2025**	22-Jul-2025	✓	**16-Jul-2025**	22-Jul-2025	✓
Soil Glass Jar - Unpreserved (EP080) CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-F/3.0, CATR01-C/0.2, CATR01-C/0.5, CATR01-C/0.9, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.2, CATR02/0.5, CATR02/0.9, QCP-01, QCP-02	**08-Jul-2025**	**16-Jul-2025**	22-Jul-2025	✓	**16-Jul-2025**	22-Jul-2025	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP202A: Phenoxyacetic Acid Herbicides by LCMS							
Soil Glass Jar - Unpreserved (EP202) CABH01/0.3, CABH02/0.3, CABH02/0.4	**07-Jul-2025**	**15-Jul-2025**	21-Jul-2025	✓	**17-Jul-2025**	24-Aug-2025	✓
Soil Glass Jar - Unpreserved (EP202) CATP02/0.1, CATP03/0.2, CATP04/0.2, CATP06/0.1	**08-Jul-2025**	**15-Jul-2025**	22-Jul-2025	✓	**17-Jul-2025**	24-Aug-2025	✓
Soil Glass Jar - Unpreserved (EP202) CATP01/0.1, CATP05/0.1	**08-Jul-2025**	**16-Jul-2025**	22-Jul-2025	✓	**21-Jul-2025**	25-Aug-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005(ED093)C: Leachable Metals by ICPAES							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG005C) CATR01-F/0.1, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.5, CATR02/0.9	**10-Jul-2025**	**14-Jul-2025**	06-Jan-2026	✓	**14-Jul-2025**	06-Jan-2026	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG005C) CATR01-F/0.5	**11-Jul-2025**	**14-Jul-2025**	07-Jan-2026	✓	**14-Jul-2025**	07-Jan-2026	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG005C) CABH02/0.3 (Ballast)	**14-Jul-2025**	**15-Jul-2025**	10-Jan-2026	✓	**15-Jul-2025**	10-Jan-2026	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) QCR-01	**07-Jul-2025**	**10-Jul-2025**	03-Jan-2026	✓	**10-Jul-2025**	03-Jan-2026	✓
EG035C: Leachable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035C) CATR01-F/0.1, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.5, CATR02/0.9	**10-Jul-2025**	**----**	----	----	**14-Jul-2025**	07-Aug-2025	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035C) CATR01-F/0.5	**11-Jul-2025**	**----**	----	----	**14-Jul-2025**	08-Aug-2025	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035C) CABH02/0.3 (Ballast)	**14-Jul-2025**	**----**	----	----	**15-Jul-2025**	11-Aug-2025	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG035T) QCR-01	**07-Jul-2025**	**----**	----	----	**10-Jul-2025**	04-Aug-2025	✓
EP071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071-SV) CABH02/0.3 (Ballast)	**14-Jul-2025**	**15-Jul-2025**	21-Jul-2025	✓	**15-Jul-2025**	24-Aug-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071-SV)							
CABH02/0.3 (Ballast)	**14-Jul-2025**	**15-Jul-2025**	21-Jul-2025	✓	**15-Jul-2025**	24-Aug-2025	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
QCR-01	**07-Jul-2025**	**14-Jul-2025**	14-Jul-2025	✓	**15-Jul-2025**	23-Aug-2025	✓
Amber Glass Bottle - Unpreserved (EP075(SIM))							
CATR01-F/0.1	**10-Jul-2025**	**15-Jul-2025**	17-Jul-2025	✓	**15-Jul-2025**	24-Aug-2025	✓
Amber Glass Bottle - Unpreserved (EP075(SIM))							
CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.5, CATR02/0.9	**10-Jul-2025**	**15-Jul-2025**	17-Jul-2025	✓	**16-Jul-2025**	24-Aug-2025	✓
Amber Glass Bottle - Unpreserved (EP075(SIM))							
CATR01-F/0.5	**11-Jul-2025**	**15-Jul-2025**	18-Jul-2025	✓	**16-Jul-2025**	24-Aug-2025	✓
Amber Glass Bottle - Unpreserved (EP075(SIM))							
CABH02/0.3 (Ballast)	**14-Jul-2025**	**15-Jul-2025**	21-Jul-2025	✓	**16-Jul-2025**	24-Aug-2025	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
QCR-01	**07-Jul-2025**	**14-Jul-2025**	14-Jul-2025	✓	**15-Jul-2025**	23-Aug-2025	✓
Amber Glass Bottle - Unpreserved (EP071)							
CATR02/0.9	**10-Jul-2025**	**15-Jul-2025**	17-Jul-2025	✓	**15-Jul-2025**	24-Aug-2025	✓
Amber Glass Bottle - Unpreserved (EP071)							
CATR01-F/0.1, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.5	**10-Jul-2025**	**15-Jul-2025**	17-Jul-2025	✓	**16-Jul-2025**	24-Aug-2025	✓
Amber Glass Bottle - Unpreserved (EP071)							
CATR01-F/0.5	**11-Jul-2025**	**15-Jul-2025**	18-Jul-2025	✓	**16-Jul-2025**	24-Aug-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
QCR-01	**07-Jul-2025**	**10-Jul-2025**	21-Jul-2025	✓	**10-Jul-2025**	21-Jul-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.5, CATR02/0.9	**10-Jul-2025**	**14-Jul-2025**	24-Jul-2025	✓	**14-Jul-2025**	24-Jul-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
QCR-01	**07-Jul-2025**	**14-Jul-2025**	14-Jul-2025	✓	**15-Jul-2025**	23-Aug-2025	✓
Amber Glass Bottle - Unpreserved (EP071)							
CATR02/0.9	**10-Jul-2025**	**15-Jul-2025**	17-Jul-2025	✓	**15-Jul-2025**	24-Aug-2025	✓
Amber Glass Bottle - Unpreserved (EP071)							
CATR01-F/0.1, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.5	**10-Jul-2025**	**15-Jul-2025**	17-Jul-2025	✓	**16-Jul-2025**	24-Aug-2025	✓
Amber Glass Bottle - Unpreserved (EP071)							
CATR01-F/0.5	**11-Jul-2025**	**15-Jul-2025**	18-Jul-2025	✓	**16-Jul-2025**	24-Aug-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
QCR-01	**07-Jul-2025**	**10-Jul-2025**	21-Jul-2025	✓	**10-Jul-2025**	21-Jul-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.5, CATR02/0.9	**10-Jul-2025**	**14-Jul-2025**	24-Jul-2025	✓	**14-Jul-2025**	24-Jul-2025	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
QCR-01	**07-Jul-2025**	**10-Jul-2025**	21-Jul-2025	✓	**10-Jul-2025**	21-Jul-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
CATR01-F/0.1, CATR01-F/0.5, CATR01-F/1.2, CATR01-F/1.9, CATR01-F/2.4, CATR01-A/0.1, CATR01-A/0.3, CATR02/0.5, CATR02/0.9	**10-Jul-2025**	**14-Jul-2025**	24-Jul-2025	✓	**14-Jul-2025**	24-Jul-2025	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	8	80	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5) on 40°C dried soil	EA002-AD	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202	4	31	**12.90**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5) on 40°C dried soil	EA002-AD	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	22	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfur - Total as S (LECO)	ED042T	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	37	5.41	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	22	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	37	5.41	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Leachable Mercury by FIMS	EG035C	3	21	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	3	21	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	3	26	11.54	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	10	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	26	7.69	10.00	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only	EP071-SV	1	1	100.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP) - Continued							
TRH Volatiles/BTEX	EP080	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Leachable Mercury by FIMS	EG035C	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	3	26	**11.54**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only	EP071-SV	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	10	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Leachable Mercury by FIMS	EG035C	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	3	26	**11.54**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only	EP071-SV	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	10	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Leachable Mercury by FIMS	EG035C	1	21	**4.76**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Leachable Metals by ICPAES	EG005C	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	26	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	26	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fractions Only	EP071-SV	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Lyons 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
pH (1:5) on 40°C dried soil	EA002-AD	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on 40°C dried soil after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3)
Electrical Conductivity (1:5) on 40°C dried soil	EA010-AD	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples dried at 40°C using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3
Soil Particle Density	EA152	SOIL	Soil Particle Density by AS 1289.3.5.1: Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Asbestos Identification in Soils	EA200	SOIL	AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Exchangeable Cations on Alkaline Soils	* ED006	SOIL	In house: Referenced to Soil Survey Test Method C5. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with alcoholic ammonium chloride at pH 8.5. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil.
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM Schedule B(3).
Exchangeable Cations with pre-treatment	ED008	SOIL	In house: Referenced to Rayment & Lyons Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM Schedule B(3).
Sulfur - Total as S (LECO)	ED042T	SOIL	In house: Dried and pulverised sample is combusted in a high temperature furnace in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Leachable Metals by ICPAES	EG005C	SOIL	In house: referenced to APHA 3120; USEPA SW 846 - 6010: The ICPAES technique ionises leachate sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Leachable Mercury by FIMS	EG035C	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the TCLP solution. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	SOIL	In house: Referenced to USEPA SW846, Method 3060. Hexavalent chromium is extracted by alkaline digestion. The digest is determined by photometrically by automatic discrete analyser, following pH adjustment. The instrument uses colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM Schedule B(3)
Trivalent Chromium by Alkaline Digestion and DA Finish	EG049G-Alk	SOIL	In house: Referenced to APHA 3500 Cr-A&B & 3120 and USEPA USEPA SW846, Method 3060. The difference between Total and Hexavalent Chromium. The total Chromium is determined by ICPAES and the Hexavalent chromium is extracted by alkaline digestion and the digest is determined by photometrically by automatic discrete analyser. The instrument uses colour development using dephenylcarbazide. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	SOIL	In house: Thermo Scientific Method D08727 and NEMI (National Environmental Method Index) Method ID: 9171. This method covers the determination of total oxidised nitrogen (NOx-N) and nitrate (NO3-N) by calculation, Combined oxidised Nitrogen (NO2+NO3) in a water extract is determined by direct colourimetry by Discrete Analyser.
Organic Matter	EP004	SOIL	In house: Referenced to AS1289.4.1.1. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
TRH - Semivolatile Fractions Only	EP071-SV	SOIL	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM Schedule B(3).
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
Benzo(a)pyrene and other PAHs - Waste Classification (TAS requirements)	EP075-TAS	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Analytical Methods	Method	Matrix	Method Descriptions
Phenoxyacetic Acid Herbicides (LCMS - Standard DL)	EP202	SOIL	In house: LCMS (Electrospray in negative mode). Residues of acid herbicides are extracted from soil samples under the alkaline condition. An aliquot of the alkaline aqueous phase is taken and acidified before a SPE cleanup. After eluting off from the SPE cartridge, residues of acid herbicides are dissolved in HPLC mobile phase prior to instrument analysis.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001-PR	SOIL	In house: Referenced to Rayment and Lyons 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM Schedule B(3).
Exchangeable Cations Preparation Method (Alkaline Soils)	* ED006PR	SOIL	In house: Referenced to Rayment and Lyons method 15C1.
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Lyons method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
Alkaline digestion for Hexavalent Chromium	EG048PR	SOIL	In house: Referenced to USEPA SW846, Method 3060A.
Digestion for Total Recoverable Metals in TCLP Leachate	EN25C	SOIL	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
TCLP for Non & Semivolatile Analytes - Glass Leaching Vessel	EN33a-G	SOIL	In house QWI-EN/33 referenced to USEPA SW846-1311: The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters.

Preparation Methods	Method	Matrix	Method Descriptions
TCLP for Volatile Analytes (Zero Headspace Extraction)	EN33Za	SOIL	In house QWI-EN/33 referenced to USEPA SW846-1311: ZHE (Toxicity Characteristic Leach Procedure - Zero Headspace Extraction) An extraction procedure to determine the mobility of volatile organic and inorganic analytes under specific conditions. This technique is compliant with NEPM Schedule B(3).
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
1:5 solid / water leach following drying at 40°C	EN34-AD	SOIL	10 g of 40°C dried soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Miscellaneous Leachates Procedure - Glass Leaching Vessel	* EN40-G	SOIL	Leaching procedure carried out where samples in question cannot be performed by a standard method (e.g., AS4439 or USEPA 1311) due to specific client request or the nature of the sample itself. This method is not covered under the NATA scope of accreditation.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Organic Matter	EP004-PR	SOIL	In house: Referenced to AS1289.4.1.1. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM Schedule B(3).
Extraction for Phenoxy Acid Herbicides in Soils.	EP202-PR	SOIL	In-House: Alkaline extract followed by SPE clean up of acidified portion of the sample extract.
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
Separatory Funnel Extraction of Liquids	ORG14	SOIL	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Volatiles Water Preparation	ORG16-W	SOIL	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids - VIC EPA Screen	ORG17-EM	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

FREIGHT

CLIENT: pitt&sherry	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	✠ Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Hobart		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: Cadbury ESA	ALS QUOTE NO.: EM25PITSHE0014	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: P.23.1303		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt °C
PROJECT MANAGER: Eduardo Pereira Maes	CONTACT PH: +61 414 023 658	OF: 1 2 3 4 5 6 7	Other comments:
SAMPLER: Kieran Richards	SAMPLER MOBILE: 0423 749 755	RELINQUISHED BY: Kieran Richards	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default):All		RELINQUISHED BY:
Email Reports to: EPereiraMaes@pittsh.com.au; Krichards@pittsh.com.au		DATE/TIME:	DATE/TIME:
Email Invoice to: EPereiraMaes@pittsh.com.au; accounts@pittsh.com.au			DATE/TIME: 9/7 10:Ceq

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)															Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-03 15 Metals	Metals 15 metals + Cr III + Cr VI	S-07 TRH, BTEXN, PAH	Phenoxyacid herbicides	Dioxins and Furans	Total Sulfur	NOx	Asbestos - Soil asbestos presence absence in 50g	ASC NEPM soil classification suite	S-07 with TAS EPA Bap/P LORs TRH, BTEXN and PAH with trace level LOR	TCLP Leaching	Asbestos - Solid Asbestos containing materials (ACM) fragments	Trip Blanks	W-03 + W-07 Rinsate	EN33 + EN33Z + W-26 Ballast (leachable metals and hydrocarbons)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc
1	CABH01/0.3	7/07/2025	S	1 jar	1	X		X	X												
2	CABH02/0.3	7/07/2025	S	1 jar	1	X		X	X												
3	CABH02/0.3 (Ballast)	7/07/2025	S	1 bag	1															X	
4	CABH02/0.4	7/07/2025	S	1 jar	1	X		X	X												
5	QCR-01	7/07/2025	W	4 bottles	4														X		
6	TB	7/07/2025	S	2 jars	2													X			
7	CATP01/0.1	8/07/2025	S	2 jars + 1 bag	2	X		X	X	X	X	X									
8	CATP01/0.3	8/07/2025	S	1 large jar + 1 asbestos bag Bag NR.	2		X	X					X								
9	CATP01/0.4	8/07/2025	S	1 jar	1	X		X													
10	CATP02/0.1	8/07/2025	S	1 jar	1	X		X	X												
11	CATP02/0.4	8/07/2025	S	1 JAR + 2 BAG	3		X	X					X	X							
12	CATP02/0.8	8/07/2025	S	1 jar	1	X		X													
13	CATP03/0.2	8/07/2025	S	1 jar	1	X		X	X												
14	CATP03/0.7	8/07/2025	S	1 jar	1		X	X													
15	CATP04/0.2	8/07/2025	S	1 jar	1	X		X	X												
16	CATP04/0.4	8/07/2025	S	1 large jar + 1 asbestos bag	2		X	X					X								
17	CATP04/0.7	8/07/2025	S	1 jar	1	X		X													
18	CATP05/0.1	8/07/2025	S	2 jars	2	X		X	X	X	X	X									Note one of the samples was labeled as CATP05/0.2 by mistake. Both should be CATP05/0.1
19	CATP05/0.4	8/07/2025	S	1 large jar + 1 asbestos bag Bag NR.	2		X	X					X								
20	CATP05/0.8	8/07/2025	S	1 jar	1	X		X													
				TOTAL	31																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

Environmental Division
Melbourne
Work Order Reference
EM2512262

Telephone : +61-3-8549 9600

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory please tick →

CLIENT: pitt&sherry	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	✱ Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Hobart		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: Cadbury ESA	ALS QUOTE NO.: EM25PITSHE0014	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: P.23.1303		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Eduardo Pereira Maes	CONTACT PH: +61 414 023 658	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Kieran Richards	SAMPLER MOBILE: 0423 749 755	RELINQUISHED BY: Kieran Richards	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): All	DATE/TIME:	DATE/TIME:
Email Reports to: EPereiraMaes@pittsh.com.au; Krichards@pittsh.com.au		RECEIVED BY:	RELINQUISHED BY:
Email Invoice to EPereiraMaes@pittsh.com.au; accounts@pittsh.com.au		DATE/TIME:	DATE/TIME:
			RECEIVED BY: [signature] DATE/TIME: 9/7 COB

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).														Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-03 15 Metals	Metals 15 metals + Cr III + Cr VI	S-07 TRH, BTEXN, PAH	Phenoxyacid herbicides	Dioxins and Furans	Total Sulfur	NOx	Asbestos - Soil asbestos presence/ absence in 50g	ASC NEPM soil classification suite	S-07 with TAS EPA B(a)P LORs TRH, BTEXN and PAH with trace level LOR	TCLP Leaching	Asbestos - Solid Asbestos containing materials (ACM) fragments	Trip Blanks	W-03 + W-07 Rinsate	EN33 + EN33Z + W-26 Ballast (leachable metals and hydrocarbons)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
21	CATP06/0.1	8/07/2025	S	1 jar	1	X		X	X												
22	CATP06/0.3	8/07/2025	S	1 jar + 2 bags	3		X	X					X	X							
23	CATP06/0.5	8/07/2025	S	1 jar	1	X		X													
24	CATP0.6/0.7	8/07/2026	S	1 jar	1																No testing required
25	CATR01-F/0.1	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X	X					
26	CATR01-F/0.5	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X	X					
27	CATR01-F/1.2	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X	X					
28	CATR01-F/1.9	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X	X					
29	CATR01-F/2.4	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X	X					
30	CATR01-F/3.0	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X						Hold one jar for leachate if needed (TBD)
31	CATR01-C/0.2	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X						Hold one jar for leachate if needed (TBD)
32	CATR01-C/0.5	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X						Hold one jar for leachate if needed (TBD)
33	CATR01-C/0.9	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X						Hold one jar for leachate if needed (TBD)
—	CATR01-C/3.0	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X						Hold one jar for leachate if needed (TBD)
34	CATR01-A/0.1	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X	X					
35	CATR01-A/0.3	8/07/2025	S	2 jars + 1 asbestos bag	3		X						X		X	X					
36	CATR02/0.2	8/07/2025	S	2 1 JAR + 1 BAG	2		X						X		X						Hold one jar for leachate if needed (TBD)
37	CATR02/0.5	8/07/2025	S	2 1 JAR + 1 BAG	2		X						X		X	X					
38	CATR02/0.9	8/07/2025	S	2 1 JAR + 1 BAG	2		X						X		X	X					
~~39~~																					
				TOTAL	48																

N.I.T rec'd SH 9/7 (ALS)

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; ST = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

Document Set ID: 3598180
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CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: pitt&sherry	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	⊕ Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Hobart		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: Cadbury ESA	ALS QUOTE NO.: EM25PITSHE0014	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: P.23.1303		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt °C
PROJECT MANAGER: Eduardo Pereira Maes	CONTACT PH: +61 414 023 658	OF: 1 2 3 4 5 6 7	Other comments:
SAMPLER: Kieran Richards	SAMPLER MOBILE: 0423 749 755	RELINQUISHED BY: Kieran Richards	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY: MONIQUE
COC emailed to ALS? YES	EDD FORMAT (or default): All	DATE/TIME:	DATE/TIME:	DATE/TIME	DATE/TIME: 9/7 1045
Email Reports to: EPereiraMaes@pittsh.com.au; Krichards@pittsh.com.au					
Email Invoice to: EPereiraMaes@pittsh.com.au; accounts@pittsh.com.au					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)															Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-03 15 Metals	Metals 15 metals + Cr III + Cr VI	S-07 TRH, BTEXN, PAH	Phenoxyacid herbicides	Dioxins and Furans	Total Sulfur	NOx	Asbestos - Soil asbestos presence absence in 50g	ASC NEPM soil classification suite	S-07 with TAS EPA B(a)P LORs TRH, BTEXN and PAH with trace level LOR	TCLP Leaching	Asbestos - Solid Asbestos containing materials (ACM) fragments	Trip Blanks	W-03 + W-07 Rinsate	EN33 + EN33Z + W-26 Ballast (leachable metals and hydrocarbons)	
39 ~~40~~	QCP-01	8/07/2025	S	1 jar	1	X		X													Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
→	QCS-01	8/07/2025	S	1 jar	1	X		X													Forward to Eurofins for analysis
40 ~~41~~	QCP-02	8/07/2025	S	1 jar	1	X		X													
→	QCS-02	8/07/2025	S	1 jar	1	X		X													Forward to Eurofins for analysis
				TOTAL	4																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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Hi Hannah and ALS Melb team,
Please find attached the CoC for the samples sent yesterday.
A few notes for this one (also noted in the CoC):

- I've added a couple new suites for rinsate samples (metals and hydrocarbons) and ballast samples (leachable concentrations of metals and hydrocarbons) we collected in addition to the original scope. These suites are the final two columns in the spreadsheet, shaded pink. As we didn't anticipate these samples, these suites are not in quote EM25PITSHE0014 you sent us (just a heads up).
- One of the jars for sample CATP05/0.1 was mistakenly labelled 'CATP05/0.2' please correct that label and treat both jars as the same sample CATP05/0.1
- Sample CATP06/0.7 (strikethrough in the CoC) was collected but does not require testing. Please feel free to discard this sample.
- QCS samples to be forwarded to Eurofins please.

Let me know if you have any question.
Regards,

pitt&sherry

Eduardo Pereira Maes
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PostGradDip WHS Engineering

Associate Environmental Consultant

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TO BUILD BIG
we start small

Connect on LinkedIn

pitt&sherry acknowledges the Traditional Custodians of the many Countries throughout Australia and their connections to land, sea and community. We acknowledge the contributions and sophistication of Aboriginal and/or Torres Strait Islander knowledge.

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

Attachment no. 1 to the Certificate of Analysis for work order PR2592122

Sample: CATP01/0.1

ALS SAMPLE ID: PR2592122/ 001

Measurement results PCDD/Fs:

Sample:			CATP01/0.1		
			Final extract [µl]:		75
Sample weight [g]:	3.823		Injection volume [µl]:		4
Dry matter [%]:	92		Acquisition date [d.m.y]:		26.07.2025
2,3,7,8-PCDD/Fs	Result [ng/g dw]	Limit of Detection [ng/g dw]	Limit of Quantification [ng/g dw]	[1]WHO-TEFs	WHO-TEQ Upperbound [ng/g dw]
2,3,7,8-TCDD	< 0.00061	0.00061	0.0012	1	0.00061
1,2,3,7,8-PeCDD	< 0.0014	0.0014	0.0028	1	0.0014
1,2,3,4,7,8-HxCDD	< 0.0027	0.0027	0.0053	0.1	0.00027
1,2,3,6,7,8-HxCDD	< 0.0023	0.0023	0.0047	0.1	0.00023
1,2,3,7,8,9-HxCDD	< 0.0033	0.0033	0.0067	0.1	0.00033
1,2,3,4,6,7,8-HpCDD	< 0.004	0.004	0.008	0.01	0.00004
OCDD	< 0.16	0.08	0.16	0.0003	0.000048
2,3,7,8-TCDF	< 0.00068	0.00034	0.00068	0.1	0.000068
1,2,3,7,8-PeCDF	< 0.00084	0.00084	0.0017	0.03	0.000025
2,3,4,7,8-PeCDF	< 0.00076	0.00076	0.0015	0.3	0.00023
1,2,3,4,7,8-HxCDF	< 0.0013	0.0013	0.0025	0.1	0.00013
1,2,3,6,7,8-HxCDF	< 0.0011	0.0011	0.0023	0.1	0.00011
1,2,3,7,8,9-HxCDF	< 0.0016	0.0016	0.0031	0.1	0.00016
2,3,4,6,7,8-HxCDF	< 0.0016	0.0016	0.0032	0.1	0.00016
1,2,3,4,6,7,8-HpCDF	< 0.0018	0.0018	0.0036	0.01	0.000018
1,2,3,4,7,8,9-HpCDF	< 0.005	0.005	0.01	0.01	0.00005
OCDF	< 0.0029	0.0029	0.0059	0.0003	0.00000088
WHO-TEQ from quantified 2,3,7,8-PCDD/Fs -"Lowerbound"					0
WHO-TEQ from 2,3,7,8-PCDD/Fs -„Mediumbound"					0.0019
Maximum possible WHO-TEQ -"Upperbound"					**0.0039**

PCDDs	Result [ng/g dw]	**PCDFs**	Result [ng/g dw]
Tetra-CDDs	< 0.013	Tetra-CDFs	< 0.013
Penta-CDDs	< 0.02	Penta-CDFs	< 0.024
Hexa-CDDs	< 0.027	Hexa-CDFs	< 0.02
Hepta-CDDs	< 0.008	Hepta-CDFs	< 0.0073
OCDD	< 0.16	OCDF	< 0.0029
Total PCDDs	< 0.23	Total PCDFs	< 0.067

[1]WHO 2005 TEF according to Van den Berg et al: Toxicological Sciences Advance Acces, 7 July 2006)

The limit of quantification is defined as double of the detection limit.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each 2,3,7,8-PCDD/F congener is 30% and total WHO-TEQ is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked "<" are bellow limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is levels defined in Regulation 2017/644.

CERTIFICATE OF ANALYSIS

Work Order	: **PR2592122**	Issue Date	: 29-Jul-2025
Customer	: **Australian Laboratory Services Pty Ltd.**	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: results address	Contact	: Client Service
Address	: 2 Byth Street 4051 Stafford QLD Australia	Address	: Na Harfe 336/9 Prague 9 - Vysocany 190 00 Czech Republic
E-mail	: subresults.syd@alsglobal.com	E-mail	: customer.support@alsglobal.com
Telephone	: +61 2878 48555	Telephone	: +420 226 226 228
Project	: EM2512276	Page	: 1 of 2
Order number	: 511697	Date Samples Received	: 22-Jul-2025
		Quote number	: PR2019ALSEN-AU0001 (CZ-251-19-0441)
Site	: ----	Date of test	: 23-Jul-2025 - 29-Jul-2025
Sampled by	: customer	QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory. The laboratory is not responsible for the sample data supplied by the customer and their impact on the validity of the result.
The laboratory declares that the test results relate only to the listed samples. If "ALS" is not included in the test report in the "Sampled by" section, then the results refer to the sample as received.

Responsible for accuracy

Testing Laboratory No. 1163
Accredited by CAI according to
CSN EN ISO/IEC 17025:2018

Signatories	*Position*
Lubomír Pokorný	Country Manager



The company is certified according to ČSN EN ISO 14001 (Environmental management systems) and ČSN ISO 45001 (Occupational health and safety management systems)

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

Analytical Results

Sub-Matrix: **SOIL**	*Client sample ID*	**CATP01/0.1**		**CATP05/0.1**		**----**	
	Laboratory sample ID	*PR2592122001*		*PR2592122002*		----	
	Client sampling date / time	08-Jul-2025		08-Jul-2025		----	

Parameter	*Method*	*LOR*	*Unit*	**Result**	**MU**	**Result**	**MU**	**Result**	**MU**
Physical Parameters									
Dry matter @ 105°C	S-DRY-GRCI	0.10	%	**92.0**	± 6.0%	**78.9**	± 6.0%	**----**	----
PCDDs and PCDFs (Dioxins and Furans)									
2378-TCDD	S-DFHMS03	-	ng/g DW	<0.00061	----	<0.00058	----	**----**	----
12378-PeCDD	S-DFHMS03	-	ng/g DW	<0.0014	----	<0.0014	----	**----**	----
123478-HxCDD	S-DFHMS03	-	ng/g DW	<0.0027	----	<0.0029	----	**----**	----
123678-HxCDD	S-DFHMS03	-	ng/g DW	<0.0023	----	<0.0026	----	**----**	----
123789-HxCDD	S-DFHMS03	-	ng/g DW	<0.0033	----	<0.0037	----	**----**	----
1234678-HpCDD	S-DFHMS03	-	ng/g DW	<0.004	----	<0.0052	----	**----**	----
OCDD	S-DFHMS03	-	ng/g DW	<0.16	----	<0.047	----	**----**	----
2378-TCDF	S-DFHMS03	-	ng/g DW	<0.00068	----	<0.00035	----	**----**	----
12378-PeCDF	S-DFHMS03	-	ng/g DW	<0.00084	----	<0.00064	----	**----**	----
23478-PeCDF	S-DFHMS03	-	ng/g DW	<0.00076	----	<0.00073	----	**----**	----
123478-HxCDF	S-DFHMS03	-	ng/g DW	<0.0013	----	<0.0012	----	**----**	----
123678-HxCDF	S-DFHMS03	-	ng/g DW	<0.0011	----	<0.0012	----	**----**	----
123789-HxCDF	S-DFHMS03	-	ng/g DW	<0.0016	----	<0.0018	----	**----**	----
234678-HxCDF	S-DFHMS03	-	ng/g DW	<0.0016	----	<0.0015	----	**----**	----
1234678-HpCDF	S-DFHMS03	-	ng/g DW	<0.0018	----	<0.002	----	**----**	----
1234789-HpCDF	S-DFHMS03	-	ng/g DW	<0.005	----	<0.005	----	**----**	----
OCDF	S-DFHMS03	-	ng/g DW	<0.0029	----	<0.0039	----	**----**	----
TEQ-Lowerbound	S-DFHMS03	-	ng/g DW	**0**	----	**0**	----	**----**	----
TEQ-Upperbound	S-DFHMS03	-	ng/g DW	**0.0039**	----	**0.0039**	----	**----**	----

When sampling date is not provided by the client, the laboratory determines it for procedural reasons, then it is equal to the date of receipt of the sample to the laboratory and is displayed in brackets. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.
Key: LOR = Limit of reporting; MU = Measurement Uncertainty. The MU does not include sampling uncertainty.

Brief Method Summaries

Analytical Methods	*Method Descriptions*
Location of test performance: V Raji 906 / Cacke 261 Pardubice Czech Republic 530 02	
S-DFHMS03	CZ_SOP_D06_06_175 (US EPA Method 1613B, CSN EN 16190): Determination of tetra- to octa-chlorinated dioxins and furanes by isotope dilution method using HRGC-HRMS or HRGC-MS/MS and calculation of TEQ parameters from measured value. The samples were stored in laboratory in the darkness and under temperature <4°C. Actual LOQ are noticed in the annex.
S-DRY-GRCI	CZ_SOP_D06_01_045 (CSN ISO 11465, CSN EN 12880, CSN EN 14346:2007), CZ_SOP_D06_07_046 (CSN ISO 11465, CSN EN 12880, CSN EN 14346:2007, CSN 46 5735) Determination of dry matter by gravimetry and determination of moisture by calculation from measured values.

The symbol "*" for the method indicates a test outside the scope of accreditation of the laboratory or subcontractor. If the UNICO-SUB code is stated in the method table, this only informs that the tests have been performed by a subcontractor and the results are given in an annex to the test report, including information on test accreditation. If the lab used for matrix outside the scope of accreditation or non-standard sample matrix procedure specified in the accredited method and issues non-accredited results, this fact is stated on the title page of this protocol in the section "Notes". If the test report shows the results of subcontracting, the place of performance of the test is outside the laboratories of ALS Czech Republic, s.r.o.
The method for calculating of the summation parameters is available on request in the customer service.

The end of the certificate of analysis

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

Attachment no. 2 to the Certificate of Analysis for work order PR2592122

Sample: CATP05/0.1

ALS SAMPLE ID: PR2592122/ 002

Measurement results PCDD/Fs:

Sample:			CATP05/0.1		
			Final extract [µl]:		75
Sample weight [g]:	4.209		Injection volume [µl]:		4
Dry matter [%]:	78.9		Acquisition date [d.m.y]:		26.07.2025
2,3,7,8-PCDD/Fs	Result [ng/g dw]	Limit of Detection [ng/g dw]	Limit of Quantification [ng/g dw]	[1]WHO-TEFs	WHO-TEQ Upperbound [ng/g dw]
2,3,7,8-TCDD	< 0.00058	0.00058	0.0012	1	0.00058
1,2,3,7,8-PeCDD	< 0.0014	0.0014	0.0027	1	0.0014
1,2,3,4,7,8-HxCDD	< 0.0029	0.0029	0.0059	0.1	0.00029
1,2,3,6,7,8-HxCDD	< 0.0026	0.0026	0.0052	0.1	0.00026
1,2,3,7,8,9-HxCDD	< 0.0037	0.0037	0.0074	0.1	0.00037
1,2,3,4,6,7,8-HpCDD	< 0.0052	0.0052	0.01	0.01	0.000052
OCDD	< 0.047	0.023	0.047	0.0003	0.000014
2,3,7,8-TCDF	< 0.00035	0.00035	0.00071	0.1	0.000035
1,2,3,7,8-PeCDF	< 0.00064	0.00064	0.0013	0.03	0.000019
2,3,4,7,8-PeCDF	< 0.00073	0.00073	0.0015	0.3	0.00022
1,2,3,4,7,8-HxCDF	< 0.0012	0.0012	0.0025	0.1	0.00012
1,2,3,6,7,8-HxCDF	< 0.0012	0.0012	0.0025	0.1	0.00012
1,2,3,7,8,9-HxCDF	< 0.0018	0.0018	0.0037	0.1	0.00018
2,3,4,6,7,8-HxCDF	< 0.0015	0.0015	0.0031	0.1	0.00015
1,2,3,4,6,7,8-HpCDF	< 0.002	0.002	0.004	0.01	0.00002
1,2,3,4,7,8,9-HpCDF	< 0.005	0.005	0.01	0.01	0.00005
OCDF	< 0.0039	0.0039	0.0079	0.0003	0.0000012
WHO-TEQ from quantified 2,3,7,8-PCDD/Fs -"Lowerbound"					0
WHO-TEQ from 2,3,7,8-PCDD/Fs -„Mediumbound"					0.0019
Maximum possible WHO-TEQ -"Upperbound"					**0.0039**

PCDDs	Result [ng/g dw]	**PCDFs**	Result [ng/g dw]
Tetra-CDDs	< 0.013	Tetra-CDFs	< 0.013
Penta-CDDs	< 0.019	Penta-CDFs	< 0.018
Hexa-CDDs	< 0.029	Hexa-CDFs	< 0.02
Hepta-CDDs	< 0.01	Hepta-CDFs	< 0.008
OCDD	< 0.047	OCDF	< 0.0039
Total PCDDs	< 0.12	Total PCDFs	< 0.063

[1]WHO 2005 TEF according to Van den Berg et al: Toxicological Sciences Advance Acces, 7 July 2006)

The limit of quantification is defined as double of the detection limit.

The limit of detection is defined as the amount of analyte producing a signal with S/N≥3.

The value of detection limit is mentioned as the actual value at the acquisition date.

Measurement uncertainty is expressed as a double (k=2) relative standard deviation (RSD%), and corresponds to 95% confidence interval.

Estimation of uncertainty of each 2,3,7,8-PCDD/F congener is 30% and total WHO-TEQ is 20%.

These values were ensured by analyses of certified reference material under conditions of internal reproducibility.

Results marked "<" are bellow limit of detection or quantification.

"Lowerbound" and "Upperbound" are levels defined in Regulation 2017/644 and EN 1948-4.

"Mediumbound" is levels defined in Regulation 2017/644.

FREIGHT

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: pitt&sherry	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard or urgent TAT (List due date)	FOR LABORATORY USE ONLY (Circle)
OFFICE: [illegible]		☐ Non Standard or urgent TAT (List due date)	Custody Seal Intact? Yes No N/A
PROJECT: Cadbury ESA	ALS QUOTE NO.: EM25PITSHE0014	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: P.23.1303		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Eduardo Pereira Maes	CONTACT PH: +61 414 023 658	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: Kieran Richards	SAMPLER MOBILE: 0423 749 755	RELINQUISHED BY: Kieran Richards	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): All	DATE/TIME:	DATE/TIME:
Email Reports to: EPereiraMaes@pittsh.com.au; Krichards@pittsh.com.au		RELINQUISHED BY:	RECEIVED BY:
Email Invoice to: EPereiraMaes@pittsh.com.au; accounts@pittsh.com.au		DATE/TIME:	DATE/TIME: 9/7 10:45

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)														Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-03 15 Metals	Metals 15 metals + Cr III + Cr VI	S-07 TRH, BTEX/N, PAH	Phenoxyacid herbicides	Dioxins and Furans	Total Sulfur	NOx	Asbestos - Soil asbestos presence absence in 50g	ASC NEPM soil classification suite	S-07 with TAS EPA B(a)P LORs TRH, BTEX/N and PAH with trace level LOR	TCLP Leaching	Asbestos - Solid Asbestos containing materials (ACM) fragments	Trip Blanks	W-03 + W-07 Rinsate	EN33 + EN33/ + W-26 Eldest leachate metals and hydrocarbons	
1	CABH01/0.3	7/07/2025	S	1 jar	1	X		X	X												
2	CABH02/0.3	7/07/2025	S	1 jar	1	X		X	X												
3	CABH02/0.3 (Ballast)	7/07/2025	S	1 bag	1															X	
4	CABH02/0.4	7/07/2025	S	1 jar	1	X		X	X												
5	QCR-01	7/07/2025	W	4 bottles	4														X		
6	TB	7/07/2025	S	2 jars	2													X			
7	CATP01/0.1	8/07/2025	S	2 jars + 1 Bag	2	X		X	X	X	X	X									
8	CATP01/0.3	8/07/2025	S	1 large jar + 1 asbestos bag Bag NR.	2		X	X					X								
9	CATP01/0.4	8/07/2025	S	1 jar	1	X		X													
10	CATP02/0.1	8/07/2025	S	1 jar	1	X		X	X												
11	CATP02/0.4	8/07/2025	S	1 JAR + 2 BAG	3		X	X					X	X							
12	CATP02/0.8	8/07/2025	S	1 jar	1	X		X													
13	CATP03/0.2	8/07/2025	S	1 jar	1	X		X	X												
14	CATP03/0.7	8/07/2025	S	1 jar	1		X	X													
15	CATP04/0.2	8/07/2025	S	1 jar	1	X		X	X												
16	CATP04/0.4	8/07/2025	S	1 large jar + 1 asbestos bag	2		X	X					X								
17	CATP04/0.7	8/07/2025	S	1 jar	1	X		X													
18	CATP05/0.1	8/07/2025	S	2 jars	2	X		X	X	X	X	X									
19	CATP05/0.4	8/07/2025	S	1 large jar + 1 asbestos bag Bag NR.	2		X	X					X								
20	CATP05/0.8	8/07/2025	S	1 jar	1	X		X													
				TOTAL	31																

Environmental Division
Melbourne
Work Order Reference
EM2512276

Telephone : – 61-3-8549 9600

Note one of the samples was labeled as CATP05/0.2 by mistake. Both should be CATP05/0.1

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; [illegible] Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

Pitt & Sherry (Operations) Pty Ltd
4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Eduardo Maes**

Report **1243068-S**
Project name CADBURY ESA
Project ID P.23.1303
Received Date Jul 10, 2025

Client Sample ID			**QCS-01**	**QCS-02**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**M25-JI0030542**	**M25-JI0030543**
Date Sampled			**Jul 08, 2025**	**Jul 08, 2025**
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
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
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	%	68	74
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

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Client Sample ID			QCS-01	QCS-02
Sample Matrix			Soil	Soil
Eurofins Sample No.			M25-JI0030542	M25-JI0030543
Date Sampled			Jul 08, 2025	Jul 08, 2025
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
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	%	83	77
p-Terphenyl-d14 (surr.)	1	%	61	135
Chromium (hexavalent)	1	mg/kg	< 1	< 1
Chromium (trivalent)	5	mg/kg	9.6	< 5
Heavy Metals				
Arsenic	2	mg/kg	3.3	< 2
Barium	10	mg/kg	< 10	< 10
Beryllium	2	mg/kg	< 2	< 2
Boron	10	mg/kg	< 10	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	9.6	< 5
Cobalt	5	mg/kg	< 5	< 5
Copper	5	mg/kg	< 5	< 5
Lead	5	mg/kg	< 5	5.6
Manganese	5	mg/kg	15	17
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5
Vanadium	10	mg/kg	89	27
Zinc	5	mg/kg	< 5	17
Sample Properties				
% Moisture	1	%	5.5	12

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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
Eurofins Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jul 10, 2025	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 10, 2025	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 10, 2025	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jul 10, 2025	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jul 10, 2025	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Chromium (hexavalent)	Melbourne	Jul 10, 2025	28 Days
- Method: LTM-INO-4100 Hexavalent Chromium by Spectrometric detection			
Heavy Metals	Melbourne	Jul 10, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Melbourne	Jul 10, 2025	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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	+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 & 2780	Site# 25079

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise	43 Detroit Drive	1277 Cameron Road
Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+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: Pitt & Sherry (Operations) Pty Ltd
Address: 4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Project Name: CADBURY ESA
Project ID: P.23.1303

Order No.:
Report #: 1243068
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: Jul 10, 2025 4:22 PM
Due: Jul 18, 2025
Priority: 5 Day
Contact Name: Eduardo Maes

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						NEPM 1999 Metals : Metals M15	Moisture Set	Eurofins Suite B4
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	QCS-01	Jul 08, 2025		Soil	M25-Jl0030542	X	X	X
2	QCS-02	Jul 08, 2025		Soil	M25-Jl0030543	X	X	X
Test Counts						2	2	2

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. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
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 where annotated.
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 sampling date; 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 seven 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 (CU)	

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 6.0
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 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, 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.

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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	
Naphthalene	mg/kg	< 0.5			0.5	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							
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							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Barium	mg/kg	< 10			10	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Cobalt	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Vanadium	mg/kg	< 10			10	Pass	

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Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	129			70-130	Pass	
TRH C10-C14	%	80			70-130	Pass	
TRH C6-C10	%	123			70-130	Pass	
TRH >C10-C16	%	76			70-130	Pass	
Naphthalene	%	85			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	106			70-130	Pass	
Toluene	%	109			70-130	Pass	
Ethylbenzene	%	113			70-130	Pass	
m&p-Xylenes	%	110			70-130	Pass	
Xylenes - Total*	%	109			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	115			70-130	Pass	
Acenaphthylene	%	118			70-130	Pass	
Anthracene	%	117			70-130	Pass	
Benz(a)anthracene	%	90			70-130	Pass	
Benzo(a)pyrene	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	%	78			70-130	Pass	
Benzo(g.h.i)perylene	%	98			70-130	Pass	
Benzo(k)fluoranthene	%	95			70-130	Pass	
Chrysene	%	96			70-130	Pass	
Dibenz(a.h)anthracene	%	91			70-130	Pass	
Fluoranthene	%	103			70-130	Pass	
Fluorene	%	95			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	86			70-130	Pass	
Naphthalene	%	115			70-130	Pass	
Phenanthrene	%	119			70-130	Pass	
Pyrene	%	101			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Barium	%	114			80-120	Pass	
Beryllium	%	119			80-120	Pass	
Boron	%	102			80-120	Pass	
Cadmium	%	104			80-120	Pass	
Chromium	%	97			80-120	Pass	
Cobalt	%	117			80-120	Pass	
Copper	%	115			80-120	Pass	
Lead	%	118			80-120	Pass	
Manganese	%	97			80-120	Pass	
Mercury	%	102			80-120	Pass	
Nickel	%	114			80-120	Pass	
Vanadium	%	99			80-120	Pass	
Zinc	%	107			80-120	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	92			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	M25-JI0029402	NCP	%	112			70-130	Pass	
TRH C10-C14	M25-JI0029565	NCP	%	78			70-130	Pass	
TRH C6-C10	M25-JI0029402	NCP	%	109			70-130	Pass	
TRH >C10-C16	M25-JI0029565	NCP	%	73			70-130	Pass	
Naphthalene	M25-JI0029402	NCP	%	70			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M25-JI0029402	NCP	%	91			70-130	Pass	
Toluene	M25-JI0029402	NCP	%	94			70-130	Pass	
Ethylbenzene	M25-JI0029402	NCP	%	97			70-130	Pass	
m&p-Xylenes	M25-JI0029402	NCP	%	97			70-130	Pass	
o-Xylene	M25-JI0029402	NCP	%	97			70-130	Pass	
Xylenes - Total*	M25-JI0029402	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M25-JI0030651	NCP	%	124			70-130	Pass	
Acenaphthylene	M25-JI0030651	NCP	%	94			70-130	Pass	
Anthracene	M25-JI0030651	NCP	%	94			70-130	Pass	
Benz(a)anthracene	M25-JI0030651	NCP	%	98			70-130	Pass	
Benzo(a)pyrene	M25-JI0030651	NCP	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	M25-JI0030651	NCP	%	84			70-130	Pass	
Benzo(g.h.i)perylene	M25-JI0030651	NCP	%	82			70-130	Pass	
Benzo(k)fluoranthene	M25-JI0030651	NCP	%	88			70-130	Pass	
Chrysene	M25-JI0030651	NCP	%	95			70-130	Pass	
Dibenz(a.h)anthracene	M25-JI0030651	NCP	%	98			70-130	Pass	
Fluoranthene	M25-JI0030651	NCP	%	74			70-130	Pass	
Fluorene	M25-JI0030651	NCP	%	103			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M25-JI0030651	NCP	%	72			70-130	Pass	
Naphthalene	M25-JI0030651	NCP	%	120			70-130	Pass	
Phenanthrene	M25-JI0030651	NCP	%	86			70-130	Pass	
Pyrene	M25-JI0030651	NCP	%	77			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	M25-JI0029693	NCP	%	113			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Barium	M25-JI0030519	NCP	%	124			75-125	Pass	
Beryllium	M25-JI0030690	NCP	%	79			75-125	Pass	
Cadmium	M25-JI0030690	NCP	%	85			75-125	Pass	
Chromium	M25-JI0030519	NCP	%	114			75-125	Pass	
Cobalt	M25-JI0030519	NCP	%	111			75-125	Pass	
Copper	M25-JI0030519	NCP	%	110			75-125	Pass	
Lead	M25-JI0030602	NCP	%	111			75-125	Pass	
Manganese	M25-JI0030602	NCP	%	97			75-125	Pass	
Mercury	M25-JI0030690	NCP	%	80			75-125	Pass	
Nickel	M25-JI0030519	NCP	%	108			75-125	Pass	
Vanadium	M25-JI0030519	NCP	%	114			75-125	Pass	
Zinc	M25-JI0030602	NCP	%	102			75-125	Pass	

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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 C6-C9	M25-JI0030542	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M25-JI0030957	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M25-JI0030957	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M25-JI0030957	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C6-C10	M25-JI0030542	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M25-JI0030957	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Naphthalene	M25-JI0030542	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH >C16-C34	M25-JI0030957	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M25-JI0030957	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M25-JI0030542	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M25-JI0030542	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M25-JI0030542	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M25-JI0030542	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M25-JI0030542	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	M25-JI0030542	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M25-JI0029569	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M25-JI0029518	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M25-JI0030688	NCP	mg/kg	5.4	6.3	15	30%	Pass	
Barium	M25-JI0030688	NCP	mg/kg	63	75	17	30%	Pass	
Beryllium	M25-JI0030688	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M25-JI0030688	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M25-JI0030688	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M25-JI0030688	NCP	mg/kg	57	61	7.0	30%	Pass	
Cobalt	M25-JI0030688	NCP	mg/kg	23	28	21	30%	Pass	
Copper	M25-JI0030688	NCP	mg/kg	11	12	6.0	30%	Pass	
Lead	M25-JI0030688	NCP	mg/kg	16	18	11	30%	Pass	
Manganese	M25-JI0030688	NCP	mg/kg	540	650	19	30%	Pass	
Mercury	M25-JI0030688	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M25-JI0030688	NCP	mg/kg	18	22	17	30%	Pass	

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Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Vanadium	M25-JI0030688	NCP	mg/kg	91	100	13	30%	Pass	
Zinc	M25-JI0030688	NCP	mg/kg	21	18	16	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M25-JI0030542	CP	%	5.5	6.8	21	30%	Pass	

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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

Authorised by:

Savini Suduweli	Analytical Services Manager
Luke Holt	Senior Analyst-Inorganic
Mary Makarios	Senior Analyst-Metal
Joseph Edouard	Senior Analyst-Organic
Mary Makarios	Senior Analyst-Sample Properties
Jean Veilleuse	Senior Analyst-Volatile
Edward Lee	Senior Analyst-Organic



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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eurofins

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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	+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 & 2780	Site# 25079

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NZBN: 9429046024954

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Penrose	Mount Wellington	Rolleston	Gate Pa
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+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: Pitt & Sherry (Operations) Pty Ltd
Address: 4th Floor, 113 Cimitiere Street
Launceston
Tasmania 7250

Project Name: CADBURY ESA
Project ID: P.23.1303

Order No.:
Report #: 1243068
Phone: 03 6323 1900
Fax: 03 6334 4651

Received: Jul 10, 2025 4:22 PM
Due: Jul 18, 2025
Priority: 5 Day
Contact Name: Eduardo Maes

Eurofins Analytical Services Manager : Savini Suduweli

Sample Detail						NEPM 1999 Metals : Metals M15	Moisture Set	Eurofins Suite B4
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	QCS-01	Jul 08, 2025		Soil	M25-Jl0030542	X	X	X
2	QCS-02	Jul 08, 2025		Soil	M25-Jl0030543	X	X	X
Test Counts						2	2	2

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Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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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

Sample Receipt Advice

Company name:	Pitt & Sherry (Operations) Pty Ltd
Contact name:	Eduardo Maes
Project name:	CADBURY ESA
Project ID:	P.23.1303
Turnaround time:	5 Day
Date/Time received	Jul 10, 2025 4:22 PM
Eurofins reference	1243068

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.
X	Split sample sent to requested external lab.
X	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:

Savini Suduweli on phone : +61 3 8564 5051 or by email: Savini.Suduwelikondage@eurofinsanz.com

Results will be delivered electronically via email to Eduardo Maes - emaes@pittsh.com.au.

Note: A copy of these results will also be delivered to the general Pitt & Sherry (Operations) Pty Ltd email address.

Global Leader - Results you can trust

CHAIN OF CUSTODY

ALS Laboratory, please tick →

CLIENT: pitt&sherry	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	✱ Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Hobart		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: Cadbury ESA	ALS QUOTE NO.: EM25PITSHE0014	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: P.23.1303		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Eduardo Pereira Maes	CONTACT PH: +61 414 023 658	OF: 1 2 3 4 5 6 7	Other comments:
SAMPLER: Kieran Richards	SAMPLER MOBILE: 0423 749 755	RELINQUISHED BY: Kieran Richards	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY: MONELL(AU)
COC emailed to ALS? YES	EDD FORMAT (or default): All	DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME: 9/7 1045
Email Reports to: EPereiraMaes@pittsh.com.au; Krichards@pittsh.com.au					
Email Invoice to: EPereiraMaes@pittsh.com.au; accounts@pittsh.com.au					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS (MATRIX: SOLID (S) WATER (W))			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price). Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).														Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-03 15 Metals	Metals 15 metals + Cr III + Cr VI	S-07 TRH, BTEXN, PAH	Phenoxyacid herbicides	Dioxins and Furans	Total Sulfur	NOx	Asbestos - Soil asbestos presence absence in 50g	ASC NEPM soil classification suite	S-07 with TAS EPA B(a)P LORs TRH, BTEXN and PAH with trace level LOR	TCLP Leaching	Asbestos - Solid Asbestos containing materials (ACM) fragments	Trip Blanks	W-03 + W-07 Rinsate	EN33 + EN332 + W-26 Ballast: leachable metals and hydrocarbons	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	QCP-01	8/07/2025	S	1 jar	1	X		X													Forward to Eurofins for analysis
	QCS-01	8/07/2025	S	1 jar	1	X		X													
	QCP-02	8/07/2025	S	1 jar	1	X		X													Forward to Eurofins for analysis
	QCS-02	8/07/2025	S	1 jar	1	X		X													
					TOTAL 4																

RELINQUISHED BY SR (ALS), 10/7/25

4.22 10/7/25

3.4° ice

Water Container Codes: P - Unpreserved Plastic; N - Nitric Preserved Plastic; ORC - Nitric Preserved ORC; SH - Sodium Hydroxide/Cd Preserved; S - Sodium Hydroxide Preserved Plastic; AG - Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V - VOA Vial HCl Preserved; VB - VOA Vial Sodium Bisulphate Preserved; VS - VOA Vial Sulfuric Preserved; AV - Airfreight Unpreserved Vial SG - Sulfuric Preserved Amber Glass; H - HCl preserved Plastic; HS - HCl preserved Speciation bottle; SP - Sulfuric Preserved Plastic; F - Formaldehyde Preserved Glass; Z - Zinc Acetate Preserved Bottle; E - EDTA Preserved Bottles; ST - Sterile Bottle; ASS - Plastic Bag for Acid Sulphate Soils; B - Unpreserved Bag

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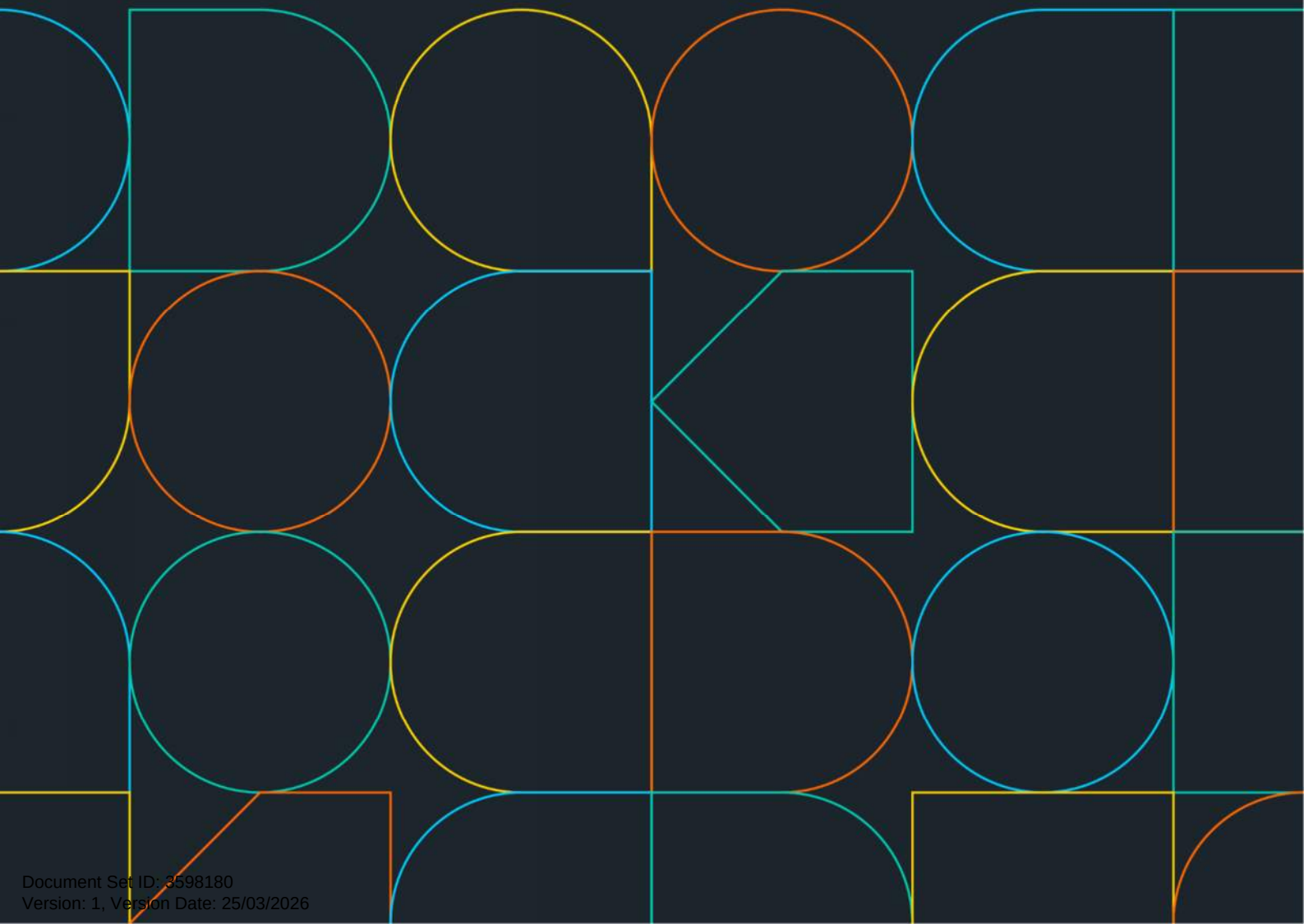
Environmental Site Assessment – Cadbury Visitor Experience Centre

100 Cadbury Road, Claremont, Tasmania 7011

Pitt & Sherry (Operations) Pty Ltd
ABN 67 140 184 309

Phone 1300 748 874
info@pittsh.com.au
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Located nationally —
Melbourne
Sydney
Brisbane
Hobart
Launceston
Newcastle
Devonport



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PURCELL

Chocolate Experience at Cadbury

100 Cadbury Road, Claremont TAS 7011

Heritage Impact Assessment

October 2025

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

Date	Issue	Revision	Reviewed	Approved
17/09/2025	00	Draft	TS	LBS
30/09/2025	01	Final	TS	LBS
02/10/2025	02	Revised final	TS	LBS

Lucy Burke-Smith

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ACKNOWLEDGMENT OF COUNTRY

Purcell pays respects to the original owners of the land upon which we work, the Muwinina people, who did not survive British colonisation.

We acknowledge the Tasmanian Aboriginal community as the continuing custodians of Lutruwita (Tasmania) and honour Aboriginal Elders past and present.

We value the history, culture and strength of the Tasmanian Aboriginal community, and commit to listen deeply to Story and be respectful of Country in our collaborations with First Nations Peoples.

Lutruwita milaythina Pakana – Tasmania is Aboriginal land.

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APPENDICES

Appendix A – Document and drawing list

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INTRODUCTION

Background

Gallagher Jeffs commissioned Purcell to prepare this Heritage Impact Assessment (HIA) to accompany a Development Application for the proposed Chocolate Experience at Cadbury (Proposal) at 100 Cadbury Road, Claremont TAS 7011 (Place), with Title Reference 139355/2.

The Place is not registered in the Tasmanian Heritage Register (THR).[1] The Place is identified as Locally Significant in GLE-Table C6.1 Local Heritage Places (Reference No. GLE-C6.1.24)[2] of the Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule (TPS-GLE).

The Place is not included in GLE-Tables C6.4 Places or Precincts of Archaeological Potential[3] and C6.5 Significant Trees[4].

GLE-Tables C6.2 Local Heritage Precincts and C6.3 Local Historic Landscape Precincts are not used in the Glenorchy Local Provisions Schedule.

The Place is also included in the Cadbury Visitor Experience Specific Area Plan, as stated in the GLE-S15.0 Cadbury Visitor Experience Specific Area Plan.[5]

The following documentation details the Proposal assessed in this HIA:

- Architectural Plans, prepared by Cumulus, dated 16/09/2025 (see Appendix A for details).
- Cumulus DA Report, Rev 2, dated September 2025 (see Appendix A for details).
- Landscape DA Report Rev B, prepared by Realm, dated 25/09/2025 (see Appendix A for details).
- Arbscape, Arborists report Rev 02, dated 17/06/2025 (see Appendix A for details).

Lucy Burke-Smith (Partner), and Xiaohan Yang of Purcell prepared this report with review by Tracey Skovronek, (Regional Partner). Lucy Burke-Smith visited the Place on 25 March 2025 and completed a physical inspection of the exterior, streetscape and context. Unless otherwise cited, all images were taken at this site visit.

Limitations

This HIA is limited to an assessment of the potential statutory built heritage impacts of the Proposal to the setting, context, and significant fabric of the registered built features on the Place. This HIA is based on the current statutory heritage, and development, controls, and non-statutory guidelines, applicable to the local heritage listed Place at 100 Cadbury Road, Claremont TAS 7011. No assessment is made of impacts of the proposed works which extend beyond the site boundary, such as the ferry wharf.

Desk-based research, and client-provided information to date form the basis of this report, no new archival research was undertaken and access to the Cadbury Mondelez archives was limited.

The HIA does not consider the proposed works' responsiveness to the wider provisions of the Tasmanian Planning Scheme - State Planning Provisions (TPS-SPP), beyond that of the performance criteria relevant to the scope of works as outlined in C6.0 *Local Historic Heritage Code*.

All references to heritage, or heritage impacts, are to registered, built heritage only. This report does not consider potential heritage impacts of the Proposal, including, without limitation, to landscape, vegetation, sub-surface, archaeological, movable, ecology or indigenous heritage.

Terminology

The conservation terminology used in this report is of a specific nature and is defined within The Burra Charter: 'The Australia ICOMOS Charter for Places of Cultural Significance', 2013, (the Burra Charter).

1 Tasmanian Heritage Council (THC), "Tasmanian Heritage Register Entries – January 2024," Search the Tasmanian Heritage Register, accessed September 04, 2025.
2 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.1 Local Heritage Places.
3 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.4 Places or Precincts of Archaeological Potential.
4 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.5 Significant Trees.
5 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-S15.0 Cadbury Visitor Experience Specific Area Plan.

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References

This HIA references the following documents:

- Tasmanian Planning Scheme - State Planning Provisions,
- The Burra Charter: 'The Australia ICOMOS Charter for Places of Cultural Significance', 2013.
- The Glenorchy Local Provisions Schedule (TPS-GLE 2025)
- R Apperly, R Irving, and PL Reynolds, A pictorial guide to identifying Australian architecture: styles and terms from 1788 to the present, Angus & Robertson, Pymble NSW, 1994.
- Good Design + Heritage, Office of the Victorian Government Architect, 2017.
- NSW Heritage Office & RAIA, Design in Context - Guidelines for Infill Development in the Historic Environment, NSW Heritage Office & RAIA, 2005.

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UNDERSTANDING THE SITE

Location

The Place's address is 100 Cadbury Road (Title Reference 139355/2). The Place is the southward facing waterfront edge of a peninsula extending northward from the suburb of Claremont in Hobarts northern suburbs. The Place includes an Industrial complex dating from the 1920s set in extensive parklands. Just beyond the Place are a collection of 16, separately listed (Tasmanian Heritage Register), and historically associated houses demonstrating the wider principles of the garden city movement.

The houses, the factory and the parkland setting a demonstrative of garden city ideals that emerged in the modernist period of the early 20th century. The Tasmanian location for the Cadbury factory was selected in preference over Victorian and New South Wales sites specifically because of its extended landscape setting between 'the mountain and the sea'.[6]



Figure 1: Aerial view, the approximate Place boundary outlined in yellow. Adjacent local and state listed places identified. (Source: ListMap, modified by Purcell)

The Place is included in the Cadbury Visitor Experience Specific Area Plan GLE-S15.0 Cadbury Visitor Experience Specific Area Plan.[7] See **Figure 2** for the area of land designated as the Specific Area Plan.

6 ARCHIVES Office of Tasmania via https://libraries.tas.gov.au/slat/blog/by-mountain-and-sea-the-model-factory-at-cadburys-claremont/ accessed 16.13pm 24/03/2025

7 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-S15.0 Cadbury Visitor Experience Specific Area Plan.

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Figure 2: Cadbury Visitor Experience Specific Area Plan (Source: TPS-GLE GLE-S15.0 Cadbury Visitor Experience Specific Area Plan)

Description

The place is included within GLE-Table C6.1 Local Heritage Places as GLE-C6.1.24 Cadbury Industrial Estate – Factory with the following description:

> *Cadbury factory complex and associated picturesque garden setting including landscaped tree-lined approaches and boundaries, and the former Cadbury Branch Line rail formation.*[8]

8 Glenorchy Local Provisions Schedule, GLE-Table C6.1 Local Heritage Places, GLE-C6.1.24 (accessed 8:42am 09/09/2025

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Recent images of the Place and its context



Figure 3: Looking toward Windermere Bay from the escarpment (Source: Purcell)



Figure 4: Escarpment from the existing jetty (Source: Purcell)



Figure 5: Approaching the Cadbury Factory along the avenue off Cadbury Road and historic parkland (Source: Purcell)



Figure 6: Looking toward Windermere Bay with the gates of the Cadbury Factory to the left of the photo (Source: Purcell)

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Figure 7: Looking toward the Factory from Bourneville Crescent (Source: Purcell)



Figure 8: Looking toward Windermere Bay through the Factory (Source: Purcell)



Figure 9: Parkland of the Place with exotic trees and bespoke furniture (Source: Purcell)



Figure 10: Avenue of the Place with agapanthuses (Source: Purcell)



Figure 11: Entry gates, Cadbury Clock and the Factory, with Gatehouse on the left of the photo obscured by vines (Source: Purcell)



Figure 12: Parkland of the Place with native species and glimpses to Windermere Bay and kunanyi/Mt Wellington (Source: Purcell)

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Figure 13: View down the avenue of Pinus Radiata, away from the Factory (Source: Purcell)



Figure 14: Concrete Lamp within landscaped grounds (Source: Purcell)

Historical imagery



Figure 15: Aerial view c.1930s (Source: TA AA193-1-1236)



Figure 16: Claremont Peninsular, undated c.1950s. Note reduction of arboretum for carparking (Source: TA AB713-1-11240)

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Figure 17: *Cadbury's by mountain and sea, Claremont, Tasmania*, Harry Kelly (Source: TA SD_ILS:66600) Depicting factory site within wider context of the garden suburb. The red roofed buildings to the centre are represented in Figure 18 and are now demolished.



Figure 18: Factory entrance gates 1930s (Source: Image 31 Images of Tasmania as collected by Colin Denison: University of Tasmania Library Special and Rare Collections)



Figure 19: Looking along the alignment of the avenue toward the Cadbury Clock, factory gates and gatehouse being the worker entry (Source: Images of Tasmania as collected by Colin Denison: University of Tasmania Library Special and Rare Collections)

Statutory listings and overview of significance

Historic Cultural Heritage Act (TAS) 1995

The Place is not registered on the Tasmanian Heritage Register.

Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule

The Place (Title Reference 139355/2) is identified as Locally Significant in GLE-Table C6.1 Local Heritage Places (Reference No. GLE-C6.1.24)[9] as following:

Property Name:

Cadbury Industrial Estate – Factory

9 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.1 Local Heritage Places.

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Description:

Cadbury factory complex and associated picturesque garden setting including landscaped tree-lined approaches and boundaries, and the former Cadbury Branch Line rail formation.

Specific Extent:

All of 139355/2.

Statement of Local Historic Heritage Significance and Historic Heritage Values:

The setting and design of the Cadbury Industrial complex exhibits garden city ideals and the high engineering and architectural design standards historically underpinning buildings and plant includes elements considered innovative in the context of the global confectionary industry. The place has strong community and inter-generational associations arising from the long-time involvement of Cadbury (and its various parent entities) both as a major employer and supporter of local initiatives.

Identified in the Local Provisions Schedule because of:

(a) Its role in, representation of, or potential for contributing to the understanding of:

(a)(i) Local history including – as a major socially orientated enterprise in the post-WW1 industrialisation of the municipality/City of Glenorchy.

(a)(ii) Creative or technical achievements including - its adherence to 'garden city movement' principles in its presentation and its demonstration of technical proficiency including but not limited to the use of reinforced concrete applied by Edward Giles Stone in the initial phase of construction and Sir Victor Burley's innovative (world first) Continuous Crumb Plant.

(a)(iii) A class of building or place that exhibits - the principal characteristics of an established industrial plant. Significant attributes include but are not necessarily limited to: Inter-War Functionalist and Post-War International style buildings in a mature designed landscape setting.

(a)(iv) Aesthetic characteristics - imparted through 'Garden city' type design principles in creating a picturesque setting and architectural design aesthetic and that dovetails with the adjoining 'garden suburb' and associated civic spaces.

(b) Its association with:

(b)(i) A particular community for social or spiritual reasons being - employees past and present of the Cadbury Company (and its derivatives) many with inter-generational associations, and the Society of Friends (or Quaker) movement which provided the philosophical basis for this benevolent approach.

(b)(ii) The life or works of - celebrated Tasmanian engineer [Sir] Victor George Burley over a period of 40 years; Tasmanian architectural firms Hutchinson and Walker, and, Wilkinson and Bolt.

The Place is not included in GLE-Tables C6.4 Places or Precincts of Archaeological Potential[10] and C6.5 Significant Trees[11].

GLE-Tables C6.2 Local Heritage Precincts and C6.3 Local Historic Landscape Precincts are not used in the Glenorchy Local Provisions Schedule.

The Place is also included in the Cadbury Visitor Experience Specific Area Plan as stated in the GLE-S15.0 Cadbury Visitor Experience Specific Area Plan.[12] In the area of land this plan applies to, the provisions of the Specific Area Plan are in addition to and a modification to the provisions of Local Historic Preservation Code.

Non-statutory listings

The Place is not included on the Register of the National Estate (non-statutory archive).[13]

The Tasmanian National Trust no longer maintains a publicly available list of Tasmanian Heritage places.

10 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.4 Places or Precincts of Archaeological Potential.
11 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.5 Significant Trees.
12 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-S15.0 Cadbury Visitor Experience Specific Area Plan.
13 Department of Climate Change, Energy, the Environment and Water (DCCEEW), 'Search the Australian Heritage Database' [website], accessed 04/09/2025

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Proposed works

The following overview of the proposed works is taken from the Supporting planning report, prepared by Era Advisory, 20 September 2025:

> The Project is for a new visitor experience located in the parklands of the Cadbury chocolate factory site.
>
> The chocolate experience at Cadbury (CEC) is a purpose-built, multi-level visitor attraction co-located on the industrial site known as the Cadbury Claremont factory. The site combines immersive chocolate experiences, food and beverage offerings, and family-friendly amenities.
>
> The CEC will comprise a new three storey building with supporting infrastructure including new and upgraded pedestrian paths, upgraded car parking access, landscaping and wayfinding. A new jetty to Windermere Bay is a critical new piece of infrastructure, with boat transport via the Timtumili minanya/River Derwent the primary arrival method for visitors2.
>
> Guests will enter 'Chocolate Central': an atrium-like space, and begin their tour through a collection of immersive, multi-sensory experiences. A ticketed visitor journey to be "the world's most extraordinary chocolate experience", guests will move through a series of experience spaces blending storytelling, technology and hands-on participation.
>
> Spaces will include a core set of experiences framed around the chocolate making story and historic interpretation of the site, from growing cacao through to final product, including celebrating the history of the Cadbury site, an opportunity to view artisan chocolatiers at work and a taste kitchen. Beyond the core experience, visitors can extend their stay through premium add-on experiences including building your own chocolate bar and a 45-minute masterclass.
>
> Supporting the visitor experience are a series of social and leisure spaces, including the lounge, café and emporium. The lounge will be available for use by ticketed guests only or for group function bookings. The café and emporium will be available to the general public and will not require tickets to be purchased. The café will be for casual eating including indoor and outdoor dining spaces. The outdoor dining space will extend into the playground area on the northern side of the building, ultimately merging with the existing parkland. The emporium will sell a range of artisan chocolate products produced in the new building as well as Cadbury products.[14]

A summary of the key features is outlined in Table 2[15] of the planning report. Noting that some aspects of the proposal are beyond the listed boundary of the place the following Table is a reduced extract of this information:

Item	Provision
New CEC building	A new building with maximum building height of 18.86 metres and gross floor area of 7,304m2 across three levels (with roof plant) as follows: · Ground floor – 2,743m2 in area containing building entrance, 'chocolate central', emporium, café, amenities and 'back of house' spaces including plant and equipment rooms, warehouse storage and commercial kitchen. · First floor – 2,098m2 in area containing experience spaces (laboratory and tropical house, factory control room and masterclass production) as well as circulation spaces, amenities and staff facilities including offices. · Second floor - 1,995m2 in area containing the taste kitchen, artisan chocolate making production areas and the 'chocolate lounge'.

14 Chocolate Experience at Cadbury Supporting Planning Report, Era Advisory, Draft V1 20 September 2025, p.11
15 Chocolate Experience at Cadbury Supporting Planning Report, Era Advisory, Draft V1 20 September 2025, p.12

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	· Roof plant – 468m2 containing plant and equipment On the northern side of the building will be a forecourt, outdoor dining area, playground and landscaping which merges into the surrounding playground.
Car parking and deliveries	Spaces for car parking and deliveries will be provided across discrete areas as follows: A deliveries area (loading bay) will be provided as part of the new CEC building (located between the building and the existing factory). Access to this loading bay will be via the existing internal private service road network off Cadbury Road. In addition to the dedicated car parking area for visitors at the existing Cadbury factory car park, dedicated DDA compliant parking (3 spaces), parent and pram parking (12 spaces) and a bus loading area will be provided along the tree-lined avenue that forms part of the existing internal private service road network and is adjacent to the new CEC building. This car parking can be accommodated within the existing paved width of the service road. A bicycle parking area accommodating 20 spaces is provided for between the new CEC building and the existing internal service road.
Pedestrian paths	A new pedestrian connection from the jetty up across the riparian area to the new CEC building is proposed. The pathway will include both stair access as well as a ramp that connects to the former Cadbury Branch line which is now used as a walking track. In addition, a new dedicated pedestrian path will be provided connecting the visitor car park across Cadbury Road and through the parkland to the CEC building. A new wombat crossing on Cadbury Road is proposed as part of this pedestrian connection. All other existing pedestrian connections through the parkland and to the factory will be retained.
Landscaping and outdoor seating	On the northern side of the new CEC building an area of outdoor seating associated with the café is proposed, designed cohesively using soft and hard landscaping treatments. Detailed design of this landscaped area will be resolved in the condition endorsement phase, should the application be approved. As part of the landscaping as well as heritage mitigation response, a program of succession planting for the avenue of trees along the internal service road is also proposed.

Appendix A, Document and drawing list nominates further documentation which provide a detailed overview of the proposal.

Architect’s Design Statement

The following extracts of the DA Report prepared by Cumulus, 16/09/2025 are provided for context:

> The Cadbury Factory at 100 Cadbury Road, Claremont holds local cultural significance, recognised in the Glenorchy Local Provisions Schedule for its historical, architectural, and landscape values. The site reflects Garden City and Garden Suburb design principles, showcases innovation in the global confectionery industry, and contains notable Inter-War Functionalist and Post-War International style buildings. Its setting is enhanced by significant avenue trees, the picturesque garden approach, views to the iconic clock tower, and the historic main entrance gates.

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The new building is carefully positioned to ensure it does not interfere with or diminish the prominent views of the historic factory, preserving its visual dominance within the landscape. Only limited tree removal along the historic approach is proposed, undertaken sensitively to maintain the character of the garden setting while enabling necessary service access to the new facility. This selective clearing also presents an opportunity to open up and frame improved views towards the iconic clock tower from the historic approach of the Cadbury Service Road. [16]

The new Chocolate Experience builds on this legacy, enhancing public access and re-establishing connections to the river. Its design respects the historic relationship between production, landscape, and community framing key views to the factory and river while sitting harmoniously within the parkland. Through landscaped public spaces, selective tree clearance to open sightlines, and interpretive storytelling, it bridges past and present, celebrating the factory's identity within the river's industrial corridor and creating an engaging contemporary destination.[17]

Cumulus have outlined the following design statement:

A Factory Re-imagined

The Chocolate Experience at Cadbury aims to create the world's ultimate chocolate experience at the historic Cadbury Factory industrial site in Tasmania.

At its essence, the Cadbury Experience is a reinvention of the chocolate factory - a place where industry dissolves into imagination, where the pragmatic meets the poetic.

It is a collection of immersive, multi sensory worlds, each encapsulated within its own floating pod, suspended within the awe-inspiring grandeur of Chocolate Central. The continuous thread of colour and movement binds these experiences together, guiding visitors through a journey that unfolds with curiosity and delight.

More than a visitor attraction, the Cadbury Experience is an architectural embodiment of chocolate itself - rich, layered, and unforgettable. It is a place where magic is not just seen, but felt, tasted, and experienced in every detail, ensuring that each guest leaves with a sense of wonder - and a lingering taste of chocolate's irresistible allure.

Design Pillars

Factory in a Garden

The architectural language draws on the proud industrial heritage of the Cadbury Factory at Claremont, retaining its robust and purposeful character while embracing the softness and openness of its historic garden setting on the River Derwent / Timtumili Minanya. This interplay honours the site's legacy as both a place of production and a landscaped retreat.

Telling the Chocolate Story

Every space is designed to immerse visitors in the heritage, craft, and innovation of chocolate-making, from cacao bean to final product. The architecture itself becomes part of the narrative, revealing glimpses of production processes and layering historical references with contemporary storytelling

Creating Worlds Within a Building

The interior journey unfolds as a series of distinct, immersive 'pods', each transporting visitors into a self-contained environment with its own sensory and thematic identity. These worlds are woven together by an open, dynamic circulation thread, offering contrast and anticipation between experiences.

Environmental Sustainability

The vision is to create a chocolate experience that gives back more than it takes. Powered by renewable energy, built from low-impact materials, and designed with recycling in mind, the centre will tread lightly on its riverside setting. Rainwater harvesting, on-site gardens, and biodiverse landscapes will enrich both the environment and the visitor experience.[18]

16 Cadbury Experience Project DA Report, Cumulus, 16/09/2025, p.13
17 Cadbury Experience Project DA Report, Cumulus, 16/09/2025, p.14
18 Cadbury Experience Project DA Report, Cumulus, 16/09/2025, p.19

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Figure 20: Proposal within context of the Factory and its setting (Source: Cumulus)

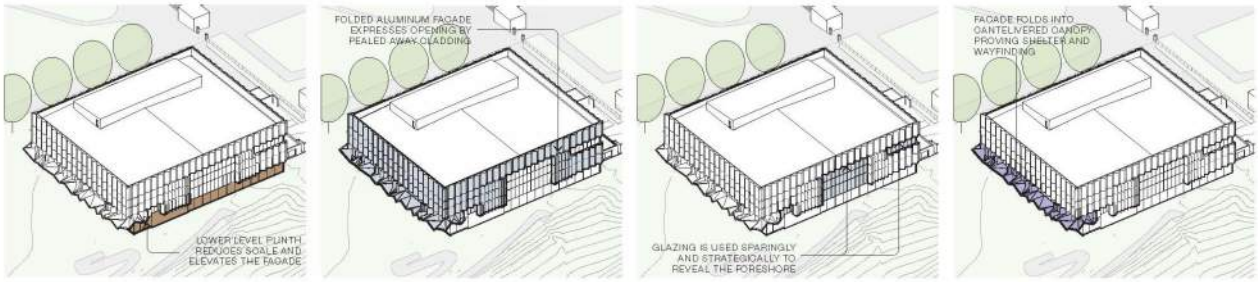


Figure 21: Façade Strategy (Source: Cumulus)

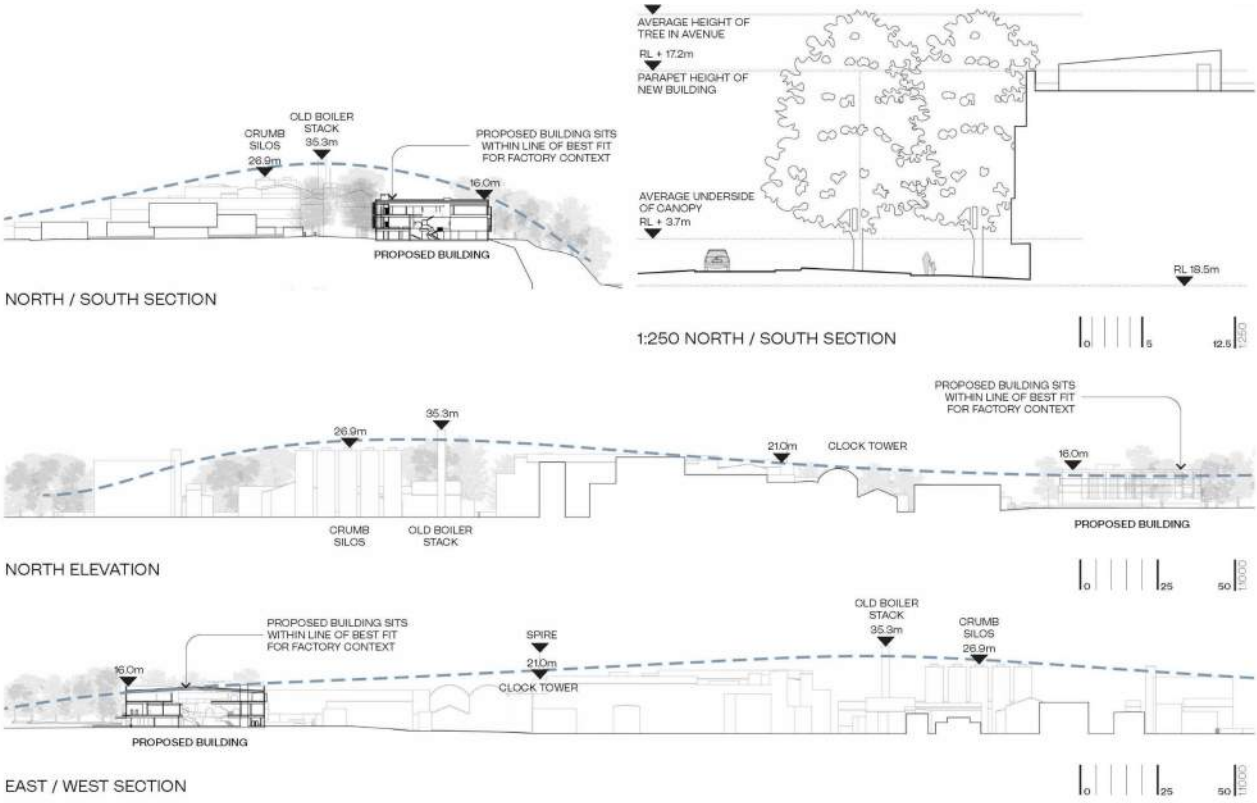


Figure 22: Analysis of scale (Source: Cumulus)

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Assessment methodology

This assessment follows the provision of preliminary heritage advice through an iterative and collaborative design process, intended to mitigate potential impact to the significance and values of the place. It is based on observations made during a site visit and a review of the design proposal.

The assessment considers the potential for detrimental impacts as a result of the proposal, as well as mitigation measures proposed, within the context of the *TPS-Local Historic Heritage Code* and *Specific Area Plan GLE-S15.0*. Proposed works have been assessed for their impact to the heritage value of the Local Heritage Place as identified in its Statement of Significance, and the place's setting and context. The Proposal has also been considered against non-statutory guidelines published by Australia ICOMOS and other industry bodies. Direct (fabric) and indirect (visual) impacts are both considered in this assessment.

Considerations of Significance

This assessment reflects on the characteristics of the place which contribute to its historic cultural heritage significance, their integrity, presentation and legibility.

Garden City ideals

The Statement of Significance notes that the place exhibits garden city ideals[19] This is represented by the designed colocation of the Factory adjacent company housing and with a wider setting of public recreational amenity, all within a landscaped setting which was to offset and counterbalance industrialisation. Cadbury at Claremont was influenced by the garden village of Bournville in England. The 'rich parklands on the sparkling waters of the Derwent and in the lee of the picturesque mountains'[20] was no doubt marketable for the excellence of all Cadbury-Fry-Pascall products[21] as it was demonstration of the philosophical approach of the company's founders, and Quaker values.

Bournville's significance as the blueprint for garden suburbs are noted as being the result of Quaker philanthropy and social ideals expressed in Urban form.[22] In addition to the factory and houses, adequate provision was made for community development and social life, including shops, schools and places for public and religious gathering and a focal village green.[23] The design approach was noted as being flexible and visually attractive. The significance of Bournville is noted in part as being illustrative of changing patterns of residential development and continual experimentation in the development of the estate.[24]

It was noted in the 1920s that 31 acres were reserved for the factory and 58 acres for the reservation of the shore and for recreational purposes.[25] This allocation enforces that the principles for the place were not simply for a factory in a garden but a wider garden suburb, the legibility of which is not strongly legible or actively interpreted today.

In souvenir pamphlets of the 1920s the place is described as having 'Sweeping flower boarded lawns' and 'very attractive garden beds'[26] as is represented in Figures 23, 26 and 27. The setting today retains little evidence of the designed landscape setting noted as contributing to its significance. The circular beds of agapanthus to the avenue may be evidence of designed elements.

It is interpreted that the nominated site was not intended as a highly regarded element of the designed and mature landscape setting significant to the place, but remnant open space between worker and operational approaches to the factory. Analysis of the site indicates that the check lodge was the main worker, and service entrance to the factory (Figure 25). This is supported by the proximity of the branch line as operational infrastructure, screened from accessible approaches by the avenue of trees. We further interpret that the alignment of the clock tower was functionally supportive of workers keeping time at their arrival to work (Figure 25). Conversely the entrance off Cadbury Road (Figure 24) was more publicly facing with the workers approach and branch line being screened by the arboretum and avenue of trees (Figures 23-28).

While several mature plantings remain with wider open spaces the designed landscape setting and lawns are not maintained. The treed avenue, as with the wider historic plantings are in poor condition and are nearing the end of their life. The arboretum noted within archival material and historic descriptions has been reduced to a collection of native and exotic species contained

19 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.1 Local Heritage Places.
20 By Mountain and Sea, Cadbury Fry Pascall Ltd Australia, pamphlet
21 By Mountain and Sea, Cadbury Fry Pascall Ltd Australia, pamphlet
22 https://www.birmingham.gov.uk/downloads/file/1264/bournville_village_conservation_area_designation_and_article_42_designation_reports
23 https://www.birmingham.gov.uk/downloads/file/1264/bournville_village_conservation_area_designation_and_article_42_designation_reports
24 https://www.birmingham.gov.uk/downloads/file/1264/bournville_village_conservation_area_designation_and_article_42_designation_reports
25 Cadbury Fry Pascall Ltd Australia Claremont Tasmania, 1922-1929, p.7
26 By Mountain and Sea, Cadbury Fry Pascall Ltd Australia, pamphlet

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to the triangular land parcel between Cadbury Road and the Cadbury Service Road. Archival images indicate that this once extended to the existing carpark (Figure 15) but was reduced by the 1950s.



Figure 23: Factory within designed landscape. (Source: TA NS1714-1-34)



Figure 24: Main public facing entrance c.1920s (Source: TA AB713-1-1423)



Figure 25: Entrance from Cadbury Service Road. Workers follow the tree lined path in the direction to the left of the image before entering the factory, as with Figure 26. Service vehicles continuing toward the clock tower (Source: TA AA193-1-566)



Figure 26: Workers having entered via Cadbury Service Road progressing along the tree lined site boundary to the entrance (Source: TA AA193-1-567)



Figure 27: Entrance from Cadbury Road beyond the main gates of Figure 24 (Source: TA AA193-1-565)



Figure 28: Site aerial c.1920s with inactivated or cultivated use of nominated site (Source: TA AA193-1-570)

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Design standards

High engineering and architectural design standards are noted as contributing to the places significance, including elements of innovative design and technology.[27] It has been recognised for its 'modern, bright and well ventilated buildings'[28]

The location, being 'the factory by Mountain and Sea'[29] has long been valued for its picturesque setting, the design being crafted accordingly.

> 'To build a factory that would not mar so picturesque a scene was no easy task, but the greatest care was taken that the building should be worthy of the site.'[30]

The factory was designed to have presence and prominence. This is reaffirmed by many of the artistic and photographic archives of the place that set it against its noted picturesque setting. The scale of the factory sits well in this landscape as opposed to dominating one with lesser natural scenic prominence.



Figure 29: Historic image showing the balance of previous open space, arboretum and designed landscape (Source: TA AA193-1-1236)



Figure 30: Context and setting demonstrating the scale of the Factory by Mountain and Sea (Source: TA AA193-1-536)

The design proposal has been developed through an iterative process and open dialogue with options for form and siting being considered and assessed. The resulting design reflects the principle that:

> An informed design response relies on understanding heritage values and assessing opportunities and constraints that arise from these.[31]

The resulting design responds to the existing site context with respect to height, massing and orientation while activating the currently underutilised parklands. The overall form does not detract from that of the existing factory building and is in keeping with the historic form and scale relative to its setting (See Cumulus DA Report September 2025, Rev 02, pp.43-55).

The architectural response has been by the place's distinctive industrial aesthetic that complements an ordered architectural framework.[32] Historically the Factory was derived from the concept of six rectangular blocks, five of which are three storeys[33] The design responds to this site planning in that:

> The new Chocolate Experience responds to the site's industrial heritage by aligning itself with the underlying, implied grid of the existing Cadbury factory.
>
> By adopting the same orientation, the building establishes a strong visual and spatial continuity, reinforcing its connection to the original manufacturing complex. This alignment not only anchors the new structure within the

27 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.1 Local Heritage Places.
28 By Mountain and Sea, Cadbury Fry Pascall Ltd Australia, p.7
29 A Century of Progress 1831-1931, Cadbury Bournville, T.B Rogers, 1931, p.83
30 By Mountain and Sea, Cadbury Fry Pascall Ltd Australia, p.5
31 Good Design and Heritage, OVGA, 2016, p.5
32 Cadbury Experience Project DA Report, Cumulus, 16/09/2025, p.35
33 By Mountain and Sea, Cadbury Fry Pascall Ltd Australia, p.5

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historic fabric of the site but also creates a sense of order and rhythm that echoes the factory's functional planning.

The result is a contemporary intervention that feels intrinsically linked to its context, respecting the geometry of the past while accommodating the dynamic, immersive experiences of the future.[34]

Social values

The place has historic associations with community as a major employer and for the philosophical and benevolent community and social value of the Society of Friends (or Quaker) movement.[35] In addition the place is significant in the collective memory of Tasmanian's and visitors for the long-standing tourism experience which many generations have experienced.

This proposal provides a valuable opportunity for the reestablishment of the visitor tours and is intended to include an interpretation experience which showcases the history and significance of the place. This demonstrates the valuable and active contribution that the proposal will make to the significance of the place. It will reestablish a public experience which was reduce in 2008 with the cessation of factory tours, and in 2015 with the closure of the visitor centre and shop due to health and safety factors.

Assessment against the Tasmanian Planning Scheme C6.0 Local Historic Heritage Code

The Place is identified as a Local Heritage Place in GLE-Table C6.1 Local Heritage Places (Reference No. GLE-C6.1.24)[36].

The following relevant tables include our assessment against C6.6 Development Standards for Local Heritage Places[37].

C6.6 Development Standards for Local Heritage Places

C6.6.1 Demolition

Objective:	*That the demolition or removal of buildings do not cause an unacceptable impact on the local historic heritage significance of local heritage places.*
Acceptable Solution and Performance Criteria	Comment
A1 No Acceptable Solution	Not applicable. The proposal does not include the demolition or removal of a local heritage place.
P1 Demolition or removal of buildings on a local heritage place must not cause an unacceptable impact on the local historic heritage significance of the place, having regard to: (a) the physical condition of the local heritage place; (b) the extent and rate of deterioration of the building or structure; (c) the safety of the building or structure; (d) the streetscape or setting in which the building or structure is located; (e) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person; (f) any options to reduce or mitigate deterioration;	

34 Cadbury Experience Project DA Report, Cumulus, 16/09/2025, p.21
35 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.1 Local Heritage Places.
36 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.1 Local Heritage Places.
37 TPS-C6.0 Local Historic Heritage Code.

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(g) whether demolition is a reasonable option to secure the long-term future of a building or structure; and (h) any economic considerations.	

C6.6.2 Site coverage

Objective:	*That site coverage is compatible with the local historic heritage significance of local heritage places.*
Acceptable Solution and Performance Criteria	Comment
A1 No Acceptable Solution	The site coverage is compatible with the local historic heritage significance of the place, responsive to the topography of the site and the intended balance of site coverage to open space. (a) The proposed siting of the building is on contours relative to that of the RL of the existing factory site. It is set back from the escarpment of the foreshore as represented in Site Section BB, drawing A103-DA01, prepared by Cumulus 11/9/2025. (b) It was noted in the 1920s that 31 acres were reserved for the factory and 58 acres for the reservation of the shore and for recreational purposes.[38] This equates to 125453 m2 reserved for the factory and 234718 m2 for reservation and recreational purposes. In this respect the site coverage was allocated at 34.83%. Today the site is reduced to 173,207.94 m2 and has a site coverage of 30,255.98 m2 or 17.46%. The proposed building footprint 2,653.33 m2 = 1.53 % of site coverage This would bring the total building footprint to 3232,909.31 m2 or 18.99% site coverage This has been based on measurement of the title area, existing building footprint and proposed footprint. Footprint meaning the proportion of a site, excluding any access strip, covered by roofed buildings. P1 is satisfied.
P1 The site coverage must be compatible with the local historic heritage significance of a local heritage place, having regard to: (a) the topography of the site; and (b) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person.	

38 Cadbury Fry Pascall Ltd Australia Claremont Tasmania, 1922-1929, p.7

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Figure 31: Site Coverage calculations. Yellow represents existing footprint, red proposed footprint (Source: Cumulus)

C6.6.3 Height and bulk of buildings

Objective:	*That the height and bulk of buildings are compatible with the local historic heritage significance of local heritage places.*

Acceptable Solution and Performance Criteria	Comment
A1 No Acceptable Solution	The height and bulk of the building has been designed to be compatible with the overall height and bulk of the collection of existing building and structures forming the Cadbury Factory. (a) The proposed Chocolate Experience at Cadbury does not detract from the places local history as a socially oriented enterprise. Its visitor experience will extend to historic interpretation that will contribute to an understanding of the post WW1 industrialisation of the municipality of Glenorchy; intergenerational associations of employees and visitors and the associations of the Factory with the Society of Friends. The proposal has had regard for the 'garden city' movement and has consciously been designed as a building within a mature landscape setting. It is to be noted that the proposal has had to give regard to the condition and likely landscape management required of the existing plantings. In this regard it has sought to
P1 The height and bulk of buildings must be compatible with the local historic heritage significance of a local heritage place, having regard to: (a) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person; (b) the character and appearance of the existing building or place; (c) the height and bulk of other buildings in the surrounding area; and (d) the setting of the local heritage place.	

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	maintain the principal characteristics of the landscape setting. The place will maintain its principal characteristics as an established industrial plant within a mature landscaped setting. The proposal is considered to be compatible with the historic heritage significance of the place as identified within the Local Provisions Schedule. (b) The character and appearance of the existing buildings of historic heritage significance are industrial in nature. They are well designed Inter-War Functionalist and Post-War International style buildings intended for a mature designed landscape setting. The proposed Chocolate Experience at Cadbury is compatible with the character and appearance of the existing building in that it is a well-designed functionalist building. Equally the proposal retains the character of the landscape setting while seeking to respond to the long term maintenance and condition of plantings through proposed succession plantings. (c) The height and bulk of other buildings in the surrounding area, beyond the Factory site, and listed boundary, are residential in nature. As this stark relationship in height and bulk is a historic one the proposed Chocolate Experience at Cadbury is not considered a departure from the existing relationship of the Factory to the surrounding area. (d) The Cadbury factory was designed to have presence and prominence. This is reaffirmed by many of the artistic and photographic archives of the place that set it against its noted picturesque setting. The scale of the factory sits well in this landscape as opposed to dominating one with lesser natural scenic prominence. The setting of the local heritage place has been described as a 'The factory by Mountain and Sea.'[39] The proposed Chocolate Experience at Cadbury has regard for the historic setting in that it is orientated to Windemere Bay, both with respect to the arrivals sequence and principle orientation and outlook of the building. When viewed from the Bay the building is compatible with the height existing Factory presentation and does not detract from the backdrop of kunyani Mt Wellington. Its overall height is compatible with the context of the factory complex, as is represented in Site Sections Drawing A103-DA01, Cumulus, dated 11/9/2025 (See also Figure 22) P1 is satisfied.

39 A Century of Progress 1831-1931, Cadbury Bournville, T.B Rogers, 1931, p.83

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C6.6.4 Siting of buildings and structures

The Place is included in the Cadbury Visitor Experience Specific Area Plan as stated in the GLE-S15.0 Cadbury Visitor Experience Specific Area Plan.[40] In the area of land this plan applies to (Figure 35), the provisions of the Specific Area Plan are in addition to and a modification to the provisions of Local Historic Preservation Code. Therefore, Clause C6.6.4 Siting of buildings and structures is substitute by GLE-S15.7 Development Standards for Buildings and Works as listed below.

Objective:	*That the siting of buildings, works and landscaping for a Cadbury Visitor Experience:* *a) is compatible with the local historic heritage significance of the Cadbury Industrial Estate - Factory local heritage place; and* *b) considers the site's heritage setting.*

Performance Criteria	Comment
P1 The siting of buildings, works and landscaping for the Cadbury Visitor Experience must be designed to be compatible with the local historic heritage significance of the Cadbury Industrial Estate - Factory local heritage place, having regard to: (a) the historic heritage values of the local heritage place as identified in GLE-Table C6.1 Local Heritage Places; (b) any historic heritage values identified in a report prepared by a suitably qualified person; (c) the topography of the site; (d) the size, shape, and orientation of the lot; (e) retention of the clear connection between the Cadbury Factory and its extensive open parklands and setting west of the industrial buildings and plant including historical vehicular, pedestrian and tree-lined approaches to the Check Lodge and views through to the clock tower and industrial plant beyond, as shown in Figure GLE-S15.2 (Figure 35); and (f) the legibility of the former Cadbury Branch Line rail formation, as shown in Figure GLE-S15.2 (Figure 35), in the landscape.	The nominated siting of the Cadbury Visitor Experience building, works and landscaping is compatible with the historical, creative and technical significance of place. It considers the aesthetic and associational values of the places heritage setting consistent with the principles and ideals of garden suburb design. (a) The proposed Chocolate Experience at Cadbury does not detract from the places local history as a socially oriented enterprise. Its visitor experience will extend to historic interpretation that will contribute to an understanding of the post WW1 industrialisation of the municipality of Glenorchy; intergenerational associations of employees and visitors and the associations of the Factory with the Society of Friends. The proposal has had regard for the 'garden city' movement and has consciously been designed as a building within a mature landscape setting. It is to be noted that the proposal has had to give regard to the condition and likely landscape management required of the existing plantings (both native and exotic). In this regard it has sought to maintain the principal characteristics of the landscape setting. The place will maintain its primary characteristics as an established industrial plant within a mature landscaped setting. The proposal is considered to be compatible with the historic heritage significance of the place as identified within the Local Provisions Schedule. (b) This assessment accepts the values identified within GLE-Table C6.1 Local Heritage Places. It is questioned if the integrity and condition of the setting retain its legibility as a designed landscape with many of the formal elements having been removed, or poorly maintained, condition deteriorated and connectivity denuded. Notwithstanding the principles of a garden suburb are evident in the historic urban design and pattern of development, when read with the adjacent Cadbury Estate.

40 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-S15.0 Cadbury Visitor Experience Specific Area Plan.

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	(c) The proposed siting of the building is on contours relative to that of the RL of the existing factory site and is consistent in height with the proposal. It is set back from the escarpment of the foreshore as represented in Site Section BB, Drawing A103-DA01, prepared by Cumulus 11/9/2025 (See also Figure 22). As noted with respect to height the Cadbury factory was designed to have presence and prominence. This is reaffirmed by many of the artistic and photographic archives of the place that set it against its noted picturesque setting. The scale of the factory sits well in this landscape as opposed to dominating one with lesser natural scenic prominence. (d) The characteristics of the size, shape and orientation of the lot are retained and not overwhelmed by the proposal. The proposed additional footprint maintains the predominance of open space as assessed at C6.6.2 Site Coverage. The orientation of the proposal is responsive to Windemere Bay and the viewing point of historic depictions and archival images, while activating the public open space which is presently underutilised. Equally the siting retains the landscaped presentation at the streetscape orientation, and prominence of the factory when orienting oneself within the overall Cadbury Estate. The shape and occupation of the lot tapers with softer landscape edges which are retained within the proposal. (e) The proposal ensures the retention of the clear connection between the Cadbury Factory and its extensive open parklands. The historical vehicular, pedestrian and tree-lined approaches to the Check Lodge and views through to the clock tower and industrial plant beyond (as shown in Figure GLE-S15.2 (Figure 35 below)) are retained and activated by the proposal. Analysis of the site suggests that the check lodge was the main worker, and service entrance to the factory. This is supported by the proximity of the branch line as operational infrastructure, screen from accessible approaches by the avenue. We further interpret that the alignment of the clock tower was functionally supportive of workers keeping time (Figure 36). Conversely the entrance off Cadbury Road was more public facing with the workers approach and branch line being screened by the arboretum and avenue of trees (Figure 37). This interpretation suggests that the siting was not specifically attributed as open parklands but more so ‘back of house’ and lower in the hierarchy of the garden setting. (f) The legibility of the former Cadbury Branch Line rail formation is retained. There will be an interface with the proposed approach from the ferry wharf (Drawing A102-DA02, prepared by Cumulus, dated 15/9/2025).

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	It is understood that this will be interpreted as part of the visitor experience. The select heritage attributes of the branch line formation, check lodge and clock tower are not directly impacted by the proposal. The historic tree lined approach will be partially impacted by select removal of trees reaching the end of life however the avenue, and all above mentioned attributes identified within the Specific Area Plan retain their prominence and legibility. It is interpreted that the nominated site was not intended as a highly regarded element of the designed and mature landscape setting significant to the place, but remnant open space between worker and operational approaches to the factory. In this respect the siting does not greatly impact perceptions of the mature garden setting. P1 is satisfied.



Figure 32: Aerial map of the site showing selected heritage attributes (Source: TPS-GLE GLE-S15.0 Cadbury Visitor Experience Specific Area Plan)

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Figure 33: Aerial photograph indicting the historic prominence of the main entrance, compared to check lodge entrance of the Cadbury Service Road (Source: TA NS1714-1-34)

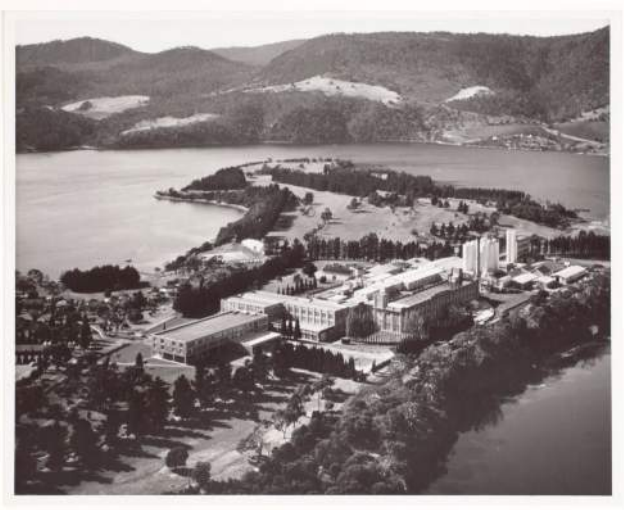


Figure 34: Aerial photograph with nominated site centre foreground (Source: TA AA193-1-1237)

C6.6.5 Fences

Objective:	*That fences are compatible with the local historic heritage significance of local heritage places.*
Acceptable Solution and Performance Criteria	Comment
A1 New fences and gates on local heritage places must be designed and constructed to match existing original fences on the site.	Not applicable. No new fences or gates are proposed.
P1 New fences and gates must be compatible with the local historic heritage significance of a local heritage place, having regard to: (a) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person; (b) the architectural style of the buildings on the site; (c) the dominant fencing style in the setting; (d) the original or previous fences on the site; and (e) the proposed height and location of the fence.	

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C6.6.6 Roof form and materials

Objective:	*That roof form and materials are compatible with the local historic heritage significance of local heritage places.*

Acceptable Solution and Performance Criteria	Comment
A1 Replacement roofs on local heritage places which will be visible from any road or public open space adjoining the site, must be of a form and material to match the existing roof being replaced.	Not applicable. No replacement roofs are proposed.
P1 Roof form and materials must be compatible with the local historic heritage significance of a local heritage place, having regard to: (a) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person; (b) the design, period of construction and materials of the building on the site that the roof directly relates to; (c) the dominant roofing style and materials in the setting; and (d) the streetscape.	

C6.6.7 Building alterations, excluding roof form and materials

Objective:	*That building alterations, excluding roof form and materials, are compatible with the local historic heritage significance of local heritage places.*

Acceptable Solution and Performance Criteria	Comment
A1 No acceptable solutions.	Not applicable. The proposal does not include alterations to an existing building forming part of the local heritage place.
P1 Building alterations, excluding roof form and materials, of an existing building that is a local heritage place must be compatible with and not detract from the local historic heritage significance of the place, having regard to: (a) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person; (b) the design, period of construction and materials of the building on the site that the building alterations most directly relate to; (c) the dominant external building materials in the setting; and (d) the streetscape.	

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C6.6.8 Outbuildings and structures

Objective:	*That the siting of outbuildings and structures are compatible with the local historic heritage significance of local heritage places.*

Performance Criteria	Comment
A1 Outbuildings and structures on local heritage places must: (a) not be located in the front setback; (b) not be visible from any road or public open space adjoining the site; (c) not have a side that is longer than 3m; (d) have a gross floor area less than 9m²; (e) have a combined total area of all outbuildings on the site of not more than 20m²; (f) have a maximum height less than 2.4m above existing ground level; (g) not have a maximum change of level as a result of cut or fill of more than 1m; and (h) not encroach on any service easement or be located within 1m of any underground service.	The TPS defines an outbuilding as a non-habitable detached building of Class 10a of the *Building Code of Australia*, including a garage, carport or shed. For the purpose of this assessment, we have interpreted that the Electrical substation, Bin Store, Mechanical Plant, MSB Room and Store are attached to the main building and assessed against C6.6.2, C6.2.3 and C6.2.4.
P1 Outbuildings and structures must be compatible with the local historic heritage significance of a local heritage place, having regard to: (a) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person; (b) the bulk, form, and size of buildings on the site; (c) the bulk, form and size of the proposed outbuilding or structure; (d) the external materials, finishes and decoration of the outbuilding or structure; and (e) the visibility of the outbuilding or structure from any road or public open space adjoining the site.	

C6.6.9 Driveways and parking for non-residential purposes

Objective:	*That driveways and parking for non-residential purposes are compatible with the local historic heritage significance of local heritage places.*

Performance Criteria	Comment
A1 Driveways and parking areas for non-residential purposes on local heritage places must be located behind the building line of buildings located or proposed on a site.	The driveway, parking areas and loading bays for the proposal are compatible with the local historic heritage significance of the place.

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P1 Driveways and parking areas for non-residential purposes must be compatible with the local historic heritage significance of a local heritage place, having regard to: (a) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person; (b) the loss of any building fabric; (c) the removal of gardens or vegetated areas; (d) parking availability in the surrounding area; (e) vehicle and pedestrian traffic safety; and (f) the streetscape.	(a) The picturesque garden setting including landscaped tree-lined approaches and boundaries are notable characteristics of the place.[41] The trees nominated for select removal will not impact the ability to interpret the place as being within a wider landscape setting. The proposal has had regard for the 'garden city' movement and has consciously been designed as a building within a mature landscape setting. It is to be noted that the proposal has had to give regard to the condition and likely landscape management required of the existing plantings. In this regard it has sought to maintain the principal characteristics of the landscape setting. The place will maintain its principal characteristics as an established industrial plant within a mature landscaped setting. The proposal is considered to be compatible with the historic heritage significance of the place as identified within the Local Provisions Schedule. (b) The proposal will not result in the loss of building fabric. (c) The isolated removal of trees and open areas is addressed in C6.6.10. (d) Parking availability within the immediate proximity of the place is limited. While it is noted that the majority of visitors will arrive by ferry and not be reliant of parking limited accessible parking is proposed to the avenue. Given the limited activation and traffic movements to the avenue this is considered acceptable and will in part contribute to the activation of the setting. (e) The proposal isolates the nominated service yard behind the building line and main entrance in support of vehicle and pedestrian safety. (f) The proposed siting of the service yard is not prominent within the streetscape and has been located to avoid impact to the streetscape and landscape setting. P1 is satisfied.

C6.6.10 Removal, destruction or lopping of trees, or removal of vegetation, that is specifically part of a local heritage place

Objective:	*That the removal, destruction or lopping of trees or the removal of vegetation that is specifically part of a local heritage place does not impact on the local historic heritage significance of the place.*
Performance Criteria	Comment
P1 The removal, destruction or lopping of trees or the removal of vegetation which is specifically part of a local heritage place listed in the relevant Local Provisions Schedule, must not cause an unreasonable impact on	The proposed removal of select trees, specifically part of the historic heritage values of the place will not result in an unreasonable impact to the local historic heritage significance of the place.

41 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.1 Local Heritage Places.

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the local historic heritage significance of a local heritage place, having regard to: (a) the historic heritage values of the local heritage place as identified in the relevant Local Provisions Schedule, or if there are no historic heritage values identified in the relevant Local Provisions Schedule, the historic heritage values as identified in a report prepared by a suitably qualified person; (b) the age and condition of the tree or vegetation; (c) the size and form of the tree or vegetation; (d) the importance of the tree or vegetation to the local historic heritage significance of a local heritage place; and (e) any advice by a suitably qualified person.	(a) The picturesque garden setting including landscaped tree-lined approaches and boundaries are notable characteristics of the place.[42] The trees nominated for select removal will not impact the ability to interpret the place as being within a wider landscape setting. The proposal has had regard for the 'garden city' movement and has been designed as a building within a mature landscape setting. It is to be noted that the proposal has had to give regard to the condition and likely landscape management required of the existing plantings. In this regard it has sought to maintain the principal characteristics of the landscape setting. The place will maintain its principal characteristics as an established industrial plant within a mature landscaped setting, with the extant portion of the arboretum being retained without impact. The proposal is considered to be compatible with the historic heritage significance of the place as identified within the Local Provisions Schedule. (b) The mature row of Pinus radiata is estimated to be 80+ years old and are showing signs of deterioration.[43] Six pine trees are noted as being impacted by the proposal with deadwood ranging from 10-40%.[44] These trees are noted as being past their prime and starting to decline. Arborists reporting goes on to note a typical lifespan of these species being 80-90 years and recommends a succession plan.[45] (c) Arboricultural input notes that 'The row of Pines along Cadbury service road have provided an avenue for nearly a century and have grown to a significant size. The health of this row is currently acceptable however some trees are in decline with high amounts of deadwood, broken upper canopy branches and heavy cone weight.'[46] (d) It is considered that it is not the species of trees but maintenance of a landscape setting that is significant to the place. In addition, it is intended that a tree lined approach to the place be maintained with succession planting. The arborist and landscape architect note alternate and more suitable species given the invasive nature of Pinus radiata and the natural values of the place. As noted within the landscape analysis the project affords the opportunity to offset the select removal of invasive species which are declining in condition with native species.[47] In turn the heritage and natural values of the place are managed.

42 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.1 Local Heritage Places.
43 Arbscape, 17 June 2025
44 Arbscape, 17 June 2025
45 Arbscape, 17 June 2025
46 Arbscape, 17 June 2025
47 Chocolate Experience at Cadbury, Landscape Report Rev B, Realm, 25/09/2205 p.7

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	(e) Advice has been sought by an Arborist (Arbscape 17 June 2025) with input to mitigating and responsive landscape design being sought from a Realm as landscape architects. P1 has been satisfied.

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Summary of assessment

The Burra Charter outlines that the impact of proposed changes, on the cultural significance of a place should be assessed with reference to the statement of significance.[48] It is our assessment that the proposal does not directly impact the features that demonstrate its principal characteristics as an established industrial plant within a mature landscape setting.[49]

There are no direct impacts to built fabric or anticipated impacts to historic archaeological potential, given that the proposal does not relate to a place or precinct of archaeological potential.

Analysis of the site and archival materials indicates that the nominated site was not intended as a highly regarded element of the designed and mature landscape setting significant to the place, but remnant open space between worker and operational approaches to the factory. In this respect the siting does not greatly impact perceptions of the mature garden setting. While there are isolated impacts to the avenue of pines it is noted that this is a single element within a wider, and denuded landscape setting. Furthermore the condition of the avenue is anticipated to require succession planting and maintenance in the near future

The visualisations, contained within the Cumulus DA Report indicate that, while large the form is consistent with that of the existing factory buildings. The site coverage is also consistent with historically assigned calculations. The considered siting of the building reduces its visibility in land approaches to the factory,[50] and is contextual when viewed from vantage points of Wilkinson's Point, Rosetta, Chigwell, Berridale, Knight's Point and Claremont.[51]

The design is innovative and contemporary. It seeks to facilitate a dual role, being both functional and interpretative, as is visually communicated through the contemporary factory aesthetic and façade design concept as a wrapped object (Figure 21).[52]

> Good design should complement existing heritage buildings or conservation areas by respecting historic character, by adapting it or by contrasting with it without overwhelming heritage values.[53]

The Cumulus design is a contemporary response which *links the past to the present and projects into the future by demonstrating an understanding and responding to the context of a place.*[54] In doing so it affords the opportunity to enhance and reinstate the social and associational significance of the place which has experienced some decline since the closure of visitor tours and public access.

Conclusion

The proposed design is a contemporary and innovative response to the reinstatement of a visitor experience and community engagement with the Cadbury Factory, its context and landscape setting. In turn it respects the rich social and associational heritage of the place within the local community, and workforce and provides *an on-going legacy in the built environment that fosters community pride and prosperity.*[55]

It is a design, which in the future will be *memorably representative of its own time.*[56] The high standard engineering and architectural design is consistent with the same high standards of the factory, as noted within the statement of significance, and with a historic critique of the original factory which noted that:

> 'The structure is simple and dignified in appearance, it has been designed primarily to give the most efficient service for the purpose of manufacture, yet it is not without artistic merit and is in keeping with the grandeur of its setting by mountain and sea.'[57]

It is likely that some will consider that the architectural style of the proposal is not consistent with the historic setting. It is however important to recognise that *Good design associated with heritage places is not a question of style, taste or replication, but of expertise, quality and skill in delivery.*[58]

48 The Burra Charter: Australia ICOMOS Charter for Places of Cultural Significance, 2013, Article 27.1
49 *Tasmanian Planning Scheme – Glenorchy Local Provisions Schedule* (TPS-GLE), updated 29 August 2025, GLE-Table C6.1 Local Heritage Places.
50 Cumulus, DA Report, September 2025, Rev 2, p.49-55
51 Cumulus, DA Report, September 2025, Rev 2, p.43-48
52 Cumulus, DA Report, September 2025, Rev 2, p.38-40
53 Good Design and Heritage, OVGA, 2016, p.5
54 Good Design and Heritage, OVGA, 2016, p.5
55 Good Design and Heritage, OVGA, 2016, p.5
56 Good Design and Heritage, OVGA, 2016, p.5
57 By Mountain and Sea, Cadbury Fry Pascall Ltd Australia, p.5
58 Good Design and Heritage, OVGA, 2016, p.4

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This being the case the proposal is consistent with the best practice principle that:

> Contemporary architecture and innovative design is an important part of the contextual approach to heritage fabric because it adds to the existing diversity and layering of architectural styles through time.[59]

Heritage practice is about protecting and enhancing the values and characteristics of a place while supporting change which can be demonstrated to not impact these values and characteristics. It is our assessment that the proposal respects and does not impact the values of the Place as a factory complex within a garden setting. It affords the opportunity to interpret the history of post WW1 industrialisation of the area, the inter-generational associations of the place, and the Society of Friends (or Quaker) movement and its philosophical values which underpin the concept of the Factory by the Sea, and garden city movement.

Recommendations

The following recommendations for conditions of approval are intended to ensure that implementation of the proposal maintains the significance and values of the place:

- A succession plan should be developed for the avenue so as to ensure its long term care and management.
- A commercial and wayfinding signage strategy should be developed to ensure that implementation is coordinated as a site wide strategy to mitigate visual impact.
- Outdoor dining and other built features in the landscape, such as future activation of the public realm should be designed and coordinated as a site wide strategy to mitigate risk of clutter and visual impact.
- An Interpretation Strategy and Plan should be developed and in accordance with best heritage practice.[60] Themes beyond the history of Cadbury-Fry-Pascall should be accounted for including Aboriginal and historic interpretation (e.g military occupation). Ideally this material should be made as publicly accessible as possible.

59 Good Design and Heritage, OVGA, 2016, p.4
60 https://www.environment.nsw.gov.au/publications/interpreting-heritage-places-and-items-guidelines

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APPENDICES

Appendix A – Document and drawing list

Author	Drawing / Document Name	Drawing No.	Rev	Date
Cumulus	A000 Cover Page	A001	DA03	16/09/2025
Cumulus	A100 Site Plan – Existing	A100	DA02	15/09/2025
Cumulus	A100 Site Plan – Deconstruction	A101	DA02	15/09/2025
Cumulus	A100 Site Plan – Proposed	A102	DA02	15/09/2025
Cumulus	Site Sections	A103	DA01	11/09/2025
Cumulus	Ground Floor Plan	A110	DA01	11/09/2025
Cumulus	Level 1 Plan	A111	DA01	11/09/2025
Cumulus	Level 2 Plan	A112	DA01	11/09/2025
Cumulus	Plan – Roof	A113	DA01	11/09/2025
Cumulus	Elevations	A200	DA02	15/09/2025
Cumulus	Sections	A300	DA01	11/09/2025
Cumulus	Chocolate Experience at Cadbury DA Report	-	Rev 2	16/09/2025
Realm	Chocolate Experience at Cadbury Landscape Development Application	-	Rev B	25/09/2025
Arbscape	Proposed development site, South of Cadbury service road. Claremont, Tasmania.	-	TBD	17/06/2025

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Marine Ecological Assessment at the Site of a Proposed Jetty and Infrastructure Development in Claremont, Tasmania

prepared for

Gallagher Jeffs

September 2025



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Version	Contributor/s	Date reviewed	Reviewed by	Notes
1	E. Johnson	12/05/2025	K. Ward	
2	E. Johnson			Includes updated design drawings and further detail on project-specific impacts.

Cover photo: Existing jetty near the Cadbury Chocolate Factory (Marine Solutions April 2025).

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Executive Summary

Marine Solutions conducted a marine natural values assessment to support the application for a new berthing facility and infrastructure for the Chocolate Experience at Cadbury, Tasmania. The assessment included a review of marine natural values using government tools like the Natural Values Atlas and EPBC Protected Matters Search Tool, identifying eight threatened and protected marine species potentially occurring in the area. While significant impacts are not expected during construction, standard mitigation measures, such as a 300m exclusion zone during piling, are recommended.

Field surveys and targeted searches for large-fruit seagrass (*Ruppia megacarpa*) identified small, unattached fragments in shallow waters, likely drifting from upstream. Specialist confirmation is needed, but precautionary measures assume its present. Impacts on *Ruppia megacarpa*, if present, are expected to be minimal as most works are planned in deeper areas.

No threatened or protected species were observed during surveys, but a few introduced marine species were found. To minimize spread, any large rocks removed from the seabed should remain within the Derwent Estuary, and vessels and machinery operating outside the estuary should be cleaned and disinfected to prevent marine pest translocation.

The seabed consists of fine silt, with shallow western areas and deeper channels in the east. Historic pollution has impacted site conditions, and sediment sampling revealed high levels of cadmium, lead, zinc, arsenic, and copper, exceeding ANZG guideline values. While impacts from constructing the berthing facility are expected to be minimal, disturbing sediments may increase turbidity and release contaminants. A silt screen and careful piling timing are therefore recommended.

Ongoing vessel activity presents a higher environmental risk, with propeller wash likely to resuspend toxic sediments, impacting water quality and marine life. The prolonged suspension of sediments may lead to cumulative environmental impacts, as contaminants can become biologically available to aquatic organisms. To reduce potential impacts, it is worth considering the use of vessels with a

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shallow draught and lateral motor propellers. Given the relatively uniform conditions across the development footprint, the environmental impacts are expected to be consistent throughout the area.

Table 1. A summary of the potential impacts and recommended mitigations for the proposed development.

	Potential impacts	**Recommended mitigations**
Marine Mammals	Acoustic impacts as a result of piling during construction pose a risk to marine mammals which may be present in the surrounding waters.	It is recommended the area should be monitored for the presence of marine mammals during construction operations and mitigation approaches for noise-generating activities.
Intertidal and subtidal habitat	*Ruppia Megacarpa* was assumed present hence there should be no unnecessary disturbance of the intertidal environment as best practice environmental management. However, as majority of works are planned in areas > 1.5 m, impacts on *Ruppia Megacarpa*, if present, are expected to be minimal.	Minimise activities along the foreshore during construction and design any structures to span over areas of the intertidal zone if possible.
Biosecurity	The translocation of introduced marine pests poses a threat to the natural values of the proposed development area and any new areas where localised site material is relocated.	Existing protocols (*Living Marine Resources Act 1995*) should be followed to ensure no marine species are translocated.
Sediment	The seabed consists primarily of unconsolidated fine sediment which can easily create sediment plumes and release contaminants to the water column if disturbed.	It is recommended to use a silt screen for any works that may cause sediment resuspension. Additionally, it is advisable to conduct piling work in calm conditions, during an outgoing tide, and/or with an offshore wind.

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1 Introduction

1.1 Proposal Brief

Marine Solutions was engaged by Michelle Mhemba from Gallagher Jeffs to conduct a marine Natural Values Assessment (NVA) to support the application for a new berthing facility and associated infrastructure for passenger transport to the Chocolate Experience at Cadbury, Tasmania.

The new chocolate experience project will bring back to life one of Tasmania's most beloved attractions on the Cadbury Factory industrial site in Claremont (Chocolate Experience at Cadbury, n.d.). The project combines 15 years of research and collaboration by Simon Currant and Associates in conjunction with Cadbury to bring a world of chocolate delights, wonder and excitement, incorporating Chocolate Central and the Premium Chocolate Studio featuring Tasmanian ingredients (Chocolate Experience at Cadbury, n.d.).

1.2 Purpose and Scope

The purpose of this report is to identify potential interactions between the proposed development and marine natural values such as threatened and protected species and communities found in the area, and to identify appropriate mitigations where applicable.

The scope of this report extends to a detailed summarisation of available information regarding natural values and ecology of the area. Please note that the scope does not extend to terrestrial and avian ecology.

Specifically, the project includes the following:

- Preparation, liaison and desktop review of potential threatened species and sensitive receptors within the development footprint and in the vicinity
- Field survey
    - Bathymetric survey
    - Jet probing

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    - Intertidal survey
    - Subtidal survey
    - Sediment sampling
        - Contaminants
        - Particle size
        - Settlement rate
- Laboratory testing for contaminants (metals and TPH)
- Data analysis and reporting

1.3 Study Area

The Cadbury Chocolate Factory is located in Claremont, Tasmania overlooking the River Derwent. Access to the new chocolate experience will be via the River Derwent on two ferries arriving at the new Cadbury Claremont ferry terminal (Figure 1 and Figure 2).

The proposed jetty landing will cover approximately 28.5 m^2 and extend approximately 9.5 m in width at the landing platform (Figure 3).

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Figure 1. Map showing location of the Cadbury factory in Claremont (Marine Solutions, 2025).

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Figure 2. Proposed jetty location (design plans constructed by Cumulus Studio PTY LTD).

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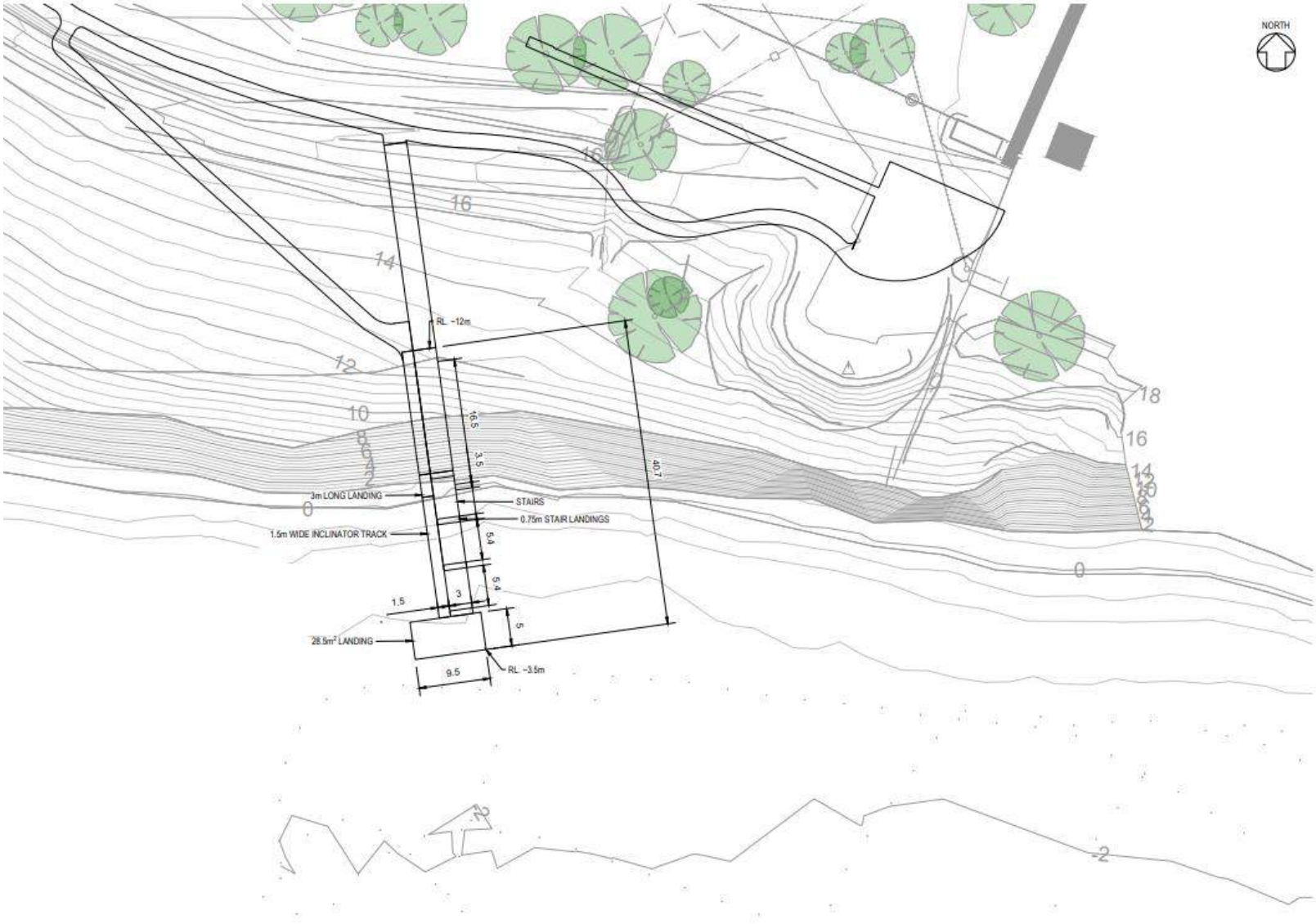


Figure 3. Proposed jetty design (design plans constructed by Pitt & Sherry).

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1.4 Vessel Type

It is Marine Solutions understanding that the ferry vessels currently being considered will be similar to MR-1 (Mona Roma-1), a high-speed catamaran ferry operated by Mona – Museum of Old and New Art in Hobart, Tasmania.

MR-1 sits roughly 1.6 m below the waterline (at the propeller), while the hull itself draws about 1.3 m. It has no thrusters, hence its only underwater appendages are the hull and main propellers—minimizing the risk of disturbing sediment in shallow environments (personal communication, May 29, 2025). Although ferry operations are yet to be determined, a well-designed vessel similar to the MR-1 is unlikely to cause significant sediment resuspension and would be a suitable choice for shallow, environmentally sensitive areas, even with frequent operations.

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2 Desktop-Based Assessment of Aquatic Sensitive Receptors

2.1 Threatened and Protected Species/Ecological Communities

There are a number of marine species listed as threatened that may occur in the vicinity of the proposed development. Threatened species are protected under the *Threatened Species Protection* (*TSP*) *Act 1995* (Tasmanian state legislation) and/or the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* (EPBC) (Australian Government legislation).

Under the *TSP Act*, no listed species is allowed to be collected, disturbed, damaged or destroyed without a permit. Under the *EPBC Act*, any action with significant impact on a listed threatened species and/or community is prohibited without approval (Section 18 and 18A).

In addition to threatened species legislation, the *Fisheries (General and Fees) Regulations 2006* under the *Living Marine Resources Management Act 1995* (LMRMA) prohibits the taking/possession of a number of marine species, including Syngnathids (seahorses, seadragons and pipehorses), handfish, threefin blennies, limpets/false limpets of three superfamilies, and five species of shark. Additional species are protected by the schedules of the *Wildlife (General) Regulations 2010* (Regulations under the *Nature Conservation Act 2002*), under which a person must not take, buy, sell or have possession of any protected wildlife or any product of any protected wildlife without a permit.

Threatened species that could potentially occur within the vicinity of the study area are discussed in greater detail in this section.

2.1.1 Methods

The EPBC Protected Matters Search Tool (PMST) is a tool managed by the Department of Climate Change, Energy, Environment and Water (DCCEEW) to help determine whether Matters of National Environmental Significance (MNES) or other matters protected by the *EPBC Act* are likely to occur in a given area of interest. The PMST was used to identify protected matters relating the study area, with a buffer of 500 m and 5000 m (DCCEEW 2025). The summary report is provided in Appendix 1.

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NRE Tas's Natural Values Atlas was then consulted to identify any verified records of threatened species occurring within the proposed development area (NRE Tas, 2025).

Findings were used to determine species for which targeted field surveys were warranted.

2.1.2 Results

In a search of the Natural Values Atlas (NRE Tas, 2025) and EPBC Protected Matters Search Tool (PMST) (DCCEEW, 2025), eight threatened marine species were identified as possibly occurring or known to occur within the area. There are verified records of six of these species within a 5000 m radius of the study area, of which one occurred within 500 m (NRE Tas, 2025) (Table 2).

On the basis of this desktop-based assessment, it was determined that targeted field surveys are warranted for one species: the large-fruit seatassel (*Ruppia megacarpa*).

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Table 2. Summary of threatened, protected species and migratory species, identified in a desktop-based assessment. Note that the scope does not extend to terrestrial or avian biota.

	Scientific Name	Common Name	Presence likelihood as per EPBC PMST *	Verified record? as per Tasmanian NVA**	Tas TSP Act Threatened Category	EPBC Act Threatened Category	EPBC Listed Migratory?
Macrophyte	*Ruppia megacarpa*	Largefruit seatassel	*Not EPBC- listed*	Yes – within 5000 m	Rare	*Not listed*	*Not listed*
Fish & Elasmobranchs	*Prototroctes maraena*	Australian grayling	Species or species habitat *likely* to occur within 500 m	Yes – within 500 m	Vulnerable	Vulnerable	No
	Lamna nasus	Porbeagle, mackerel shark	Species or species habitat likely to occur within 500 m	No	*Not listed*	*Not listed*	Yes
	Thymichthys politus	Red handfish	Species or species habitat may occur within 5000 m	No	Endangered	Critically Endangered	No
Mammals	*Eubalaena australis*	Southern right whale	*Not identified by PMST*	Yes – within 5000 m	Endangered	Endangered	Yes
	Mirounga leonina	Southern elephant seal	*Not identified by PMST*	Yes – within 5000 m	Endangered	Vulnerable	No
	Arctocephalus tropicalis	Sub-Antarctic fur seal	*Not identified by PMST*	Yes – within 5000 m	Endangered	Vulnerable	No
	Arctocephalus forsteri	New Zealand fur seal	*Not EPBC- listed*	Yes – within 5000 m	Rare	*Not listed*	*Not listed*

* Notes presence categorization of EPBC PMST (Commonwealth of Australia 2025)

** Verified records as per Tasmanian Government Natural Values Atlas (NRE Tas 2025). Note that the NVA does not document records of migratory species that are not threatened.

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2.1.2.1 Large-fruit seatassel

Species Background

The large-fruit seatassel (*Ruppia megacarpa*) is a perennial aquatic plant which grows in shallow brackish waters. The species is common on mainland Australia including New South Wales, Victoria, South Australia, and Western Australia.

Site Occurrence

In Tasmania, the species is found growing in estuaries and lagoons along the east and southeastern coast, and in brackish lagoons in the midlands (Threatened Species Section 2025). While it can tolerate low levels of salinity, the species does not survive in fully saline conditions.

Survey requirements for large-fruit seatassel are limited to the brackish environment of the Derwent River, and lagoon habitats of the eastern and southeastern coast. As the proposed development area is within the brackish environment of the Derwent River, a targeted species survey will be required in the project area.

Potential Impacts

The construction of a new berthing facility is not expected to have any significant impacts on (*Ruppia megacarpa*). It is possible that some individuals may be affected by light limitation associated with the development. However, as the majority of the proposed works will be located in areas deeper than 1.5 m—outside the depth range where *Ruppia megacarpa* tends to be observed, any potential impact from construction on this species is therefore expected to be minimal and can be mitigated with a silt curtain.

Ongoing vessel operations may have a more severe impact, as propeller wash can resuspend sediments, leading to bioaccumulation and limiting light availability, which may affect the growth of *Ruppia*.

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2.1.2.2 Australian Grayling

Species Background

Australian grayling (*Prototroctes maraena*) are medium-sized, slender, silver fish native to Tasmania and southeast mainland Australia. Migrating between fresh and marine waters, the Australian grayling is considered diadromous, though the majority of their lives are spent in freshwater and adults live and spawn in fresh water. Timing of spawning varies but is typically in late summer in Tasmania, with larvae transported to the sea via stream and river currents, before returning as migrating juveniles approximately 4 to 6 months later (Backhouse et al 2008a, b., Bryant and Jackson 1999). The most significant threat to the Australian grayling is barriers to migration and altered hydrology and coastal morphology, which may result in impacts to life cycle and breeding patterns.

Site Occurrence

The nearest verified records of the species are located near Bridgewater Bridge, approximately 6 km away from Cadbury Factory industrial site (NRE Tas 2025).

The Australian grayling's life cycle transitions between marine and fresh waters. The Derwent River provides appropriate conditions for their life cycle movements. Therefore, Australian grayling may visit the development site as a migratory route for breeding.

Potential Impacts

As the proposed development area is near the migratory route of the Australian grayling, there is potential for some disturbance. However, since the works will not create a physical barrier to migration and sediment suspension can be mitigated with a silt curtain, significant impacts from constructing the berthing facility are not anticipated. As a precautionary measure, dredging or similar works should ideally be conducted outside of January and February, when larvae typically migrate downstream if possible.

Ongoing vessel operations may pose a greater risk to the Australian grayling, as propeller wash can resuspend contaminated sediments, potentially leading to degraded water quality and increased bioavailability of toxicants.

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2.1.2.3 Porbeagle, Mackerel Shark

Species Background

The porbeagle or mackerel shark (*Lamna nasus*) is a wide-ranging shark species that inhabits oceanic waters around the continental shelf in temperate, subantarctic and subarctic waters, occasionally and temporarily moving into coastal waters (Bray, 2025). Life history characteristics such as slow growth, late maturation and low fecundity contribute to a low sustainable catch rate for the species. The porbeagle is known to be particularly vulnerable to overfishing, and historically, rapid porbeagle fishery collapses have occurred (Francis et al 2002). The species continues to be impacted by longline bycatch and recreational fishing. Coastal development is not recognised as a threat to this species.

The Porbeagle is listed as migratory under the EPBC Act, but is not listed as threatened.

Site Occurrence

Considering the preferred habitat of the species, it is very unlikely that the development will have any impact on their breeding, feeding, migration or resting. The project is not expected to have significant direct or indirect impacts on this species and thus the impact of the proposed project to porbeagles is deemed negligible.

Potential Impacts

The construction of a new berthing facility is not expected to have any significant impacts on the porbeagle or mackerel shark they are highly mobile and able to avoid constructions works. Ongoing vessel operations are also considered to have a low impact as the species is wide-ranging and can inhabit other areas.

2.1.2.4 Red Handfish

Species Background

Red handfish (*Thymichthys politus*) are endemic to south-east Tasmania. Their distribution and populations are small, limited to the coastline of south-eastern Tasmania, and known, modern, populations are limited to only two small locations in Fredrick Henry Bay (Bessel et al. 2024).

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Site Occurrence

There are no known occurrences of red handfish within the vicinity of the Cadbury Factory industrial site. Currently it is believed that populations of red handfish are limited to only two small locations in Fredrick Henry Bay.

Potential Impacts

Given what we know so far about the location of the red handfish population, this proposal is deemed highly unlikely to have any impact on this species. Additionally, the current areas requiring surveys are limited to Fredrick Henry Bay (within 5km of the shore from Dodges Ferry to Primrose Sands) and the entirety of Norfolk Bay, hence no targeted survey was conducted.

2.1.2.5 Southern Right Whale

Species Background

Southern right whales (*Eubalaena australis)* are one of Tasmania's rarest and largest mammals (NRE Tas, 2020). They can be seen between May and November when migrating north from Tasmania. Some will also stay in Tasmania during the breeding season, as these areas were their ancestral breeding grounds before whaling became a prominent industry (NRE Tas, 2020). The southern right whale population is recovering from whaling implications with significant resources and efforts put into monitoring and conserving these threatened species. They are listed as endangered under the EPBC Act and TSP Act.

Site Occurrence

There has been one verified sightings of a southern right whale approximately 1.4 km away from the proposed development (NRE Tas Species Search 2025). This observation was made in July 2000, however it is still possible that southern right whales may enter the vicinity of the proposed development during migration.

Potential Impacts

The construction of the proposed development could generate short-term acoustic impacts which may affect threatened marine mammals. In the event that the proposed development requires the

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use of impulse sound[1], noise mitigation is recommended. If impulse sound is anticipated, the Standard operating procedures outlined in *Underwater Piling Noise Guidelines* (Government of South Australia, 2012) should be adopted. The guidelines recommend the following mitigation strategies be adopted during works to minimize potential impacts on marine mammals:

1. A 300 m radius exclusion zone should be applied around the development footprint.
2. The zone should be monitored for marine mammals prior to and during any construction activities. Should any marine mammals be sighted within the exclusion zone, construction works should be halted until such time that no marine mammal has been sighted for 30 minutes.
3. A slow start-up of works activities is recommended to avoid causing unnecessary shock to animals and to allow them to vacate the area.

With the implementation of the above standard mitigation measures, the project is not expected to have significant direct or indirect impacts on southern right whales.

2.1.2.6 Southern Elephant Seal

Species Background

Southern elephant seals (*Mirounga leonina*) are earless seals easily recognisable by their large trunk-like nose and colossal body that can weigh up to 3600 kg (Bryant & Jackson, 1999). Historically, they bred on King Island, but the sealing industry caused significant declines in the population size in the early 19th century. The population is still recovering, and they are rarely seen off Tasmania's coasts. Significant breeding colonies live on Macquarie Island and Heard Island in sub-Antarctic environments. Threats to southern elephant seals include the entanglement of fishing gear, marine pollution, disturbance to breeding colonies, overfishing, which impacts their stocks, and deliberate

[1] Transient sound produced by a rapid release of energy with short duration and high peak sound pressure level e.g. From a piling impact or explosive.

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hunting (Bryant & Jackson, 1999). Under the Tasmanian TSP Act, southern elephant seals are endangered.

Site Occurrence

There have been several verified sightings of southern elephant seals in the River Derwent (NRE Tas Species Search, 2025). The closest sighting to the proposed development was observed outside Montrose Bay High School in 1982, approximately 2.77 km away. It is possible this species may occur in the vicinity of the proposed development.

Potential Impacts

Appropriate mitigation measures should be implemented to reduce the risk of noise impacts from construction activities and vessel operations on marine mammals (see Section 2.1.2.5).

2.1.2.7 Sub-Antarctic Fur Seal

Species Background

Sub-Antarctic fur seals *(Arctocephalus tropicalis*) breeding colonies occur on Macquarie Island. Sealers exterminated their historically large breeding colonies, and the populations are still recovering through recolonisation immigration from colonies further afield. They favour habitats of rocky coasts and rock platforms. Anthropogenic pollution threats, disturbance to breeding colonies, overfishing food stocks, and deliberate harm are responsible for the most significant damage to sub-Antarctic fur seals (Bryant & Jackson, 1999). Sub-Antarctic fur seals are listed as endangered under the TSP Act.

Site Occurrence

The closest verified sighting of a sub-Antarctic fur seal to the proposed development occurred in 2021, in Austins Ferry, approximately 1.55 km away. It is possible this species may occur in the vicinity of the proposed development.

Potential Impacts

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Appropriate mitigation measures should be implemented to reduce the risk of noise impacts from construction activities and vessel operations on marine mammals (see Section 2.1.2.5).

2.1.2.8 New Zealand Fur Seal

Species Background

New Zealand fur seals (*Arctocephalus forsteri*) are large seals that only discovered breeding again in Tasmania in the 1980s (TSS, 2025e). They seem to be recovering well; however, the population size is still significantly smaller than pre-sealing times. The species breeds annually at established breeding colonies on the southern coast, with pups born November – January. Major threats to New Zealand fur seals are fishing entanglements, disturbance at breeding colonies, climate change, or direct harm (TSS, 2025e).

Site Occurrence

The closest verified sighting of a New Zealand fur seal near the proposed development occurred in 2005 near Old Beach approximately 1.4 km away. It is possible this species may occur in the vicinity of the proposed development.

Potential Impacts

Appropriate mitigation measures should be implemented to reduce the risk of noise impacts from construction activities and vessel operations on marine mammals (see Section 2.1.2.5).

2.2 Invasive Species

Marine pests are introduced into Australian waters and translocated by a variety of vectors (e.g. ballast water, biofouling, aquaculture operations, and ocean current movements). Once introduced, they often thrive as they may lack predators and/or competitors in their new environment (Whitehead 2008). Pests can have a significant impact on human health, fisheries and aquaculture, infrastructure, tourism, biodiversity and ecosystem health.

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Seven species have been declared as noxious fish under State legislation[2]. These are:

- Northern Pacific sea star (*Asterias amurensis*),
- European shore crab (*Carcinus maenas*),
- European fan worm (*Sabella spallanzanii*),
- Japanese wakame (*Undaria pinnatifida*) other than in restricted zone defined in legislation,
- European carp (*Cyprinus carpio*), and

Many more are recognised as pests by the National Introduced Marine Pest Information System (NIMPIS) (Commonwealth of Australia 2023).

It should be ensured that no marine species are translocated as a result of vessel/equipment movement, by adopting a thorough cleaning protocol. Existing state legislation provides controls by which to prevent the translocation of marine pest species.

3 Targeted Surveys for Threatened and Protected Species

The desktop-based assessment (refer to Section 2) identified that the following threatened and protected species may occur in the area, and therefore a targeted search was warranted:

- Large-fruit seatassel (*Ruppia Megacarpa*)

3.1 Large-fruit seatassel (*Ruppia Megacarpa*)

3.1.1 Methods

A targeted search for large-fruit seatassel (*Ruppia Megacarpa*) was conducted in the vicinity of the proposed development. The targeted search was conducted on April 11 2025 using a 0.25 m^2 quadrat.

[2] *Fisheries (General and Fees) Regulations 1996*, *Part 20: Noxious* fish, outlined in the *Living Marine Resources Management Act 1995*

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Video footage was recorded using a GoPro Hero 8 camera mounted to the quadrat frame which was deployed from a vessel. The quadrat frame ensured images were captured from a standard distance, approximately 1 m from the bottom. A total of 55 quadrats were placed every 5 m along a 275 m transect which was parallel to the shoreline at depth of ~2 m Figure 4). The location of each transect was recorded using a GPS onboard the vessel. Due to poor visibility, a shoreline search was also conducted to assess the presence of *Ruppia megacarpa,* and to determine whether it was drifting or attached to the substrate.



Figure 4. Location of targeted search for large-fruit seatassel (*Ruppia Megacarpa*).

3.1.2 Results

No established beds of large-fruit seatassel (*Ruppia Megacarpa*) were observed. Drifts of aquatic macrophytes of unknown origin were caught on the camera frame. It is possible these macrophytes

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were *Ruppia Megacarpa* however, considering they were not attached to the substrate, they likely drifted to the area from further upstream. Small amounts of *Ruppia Megacarpa* were believed to be observed in very shallow water < 50 cm from the shoreline, accompanied by patches of seagrass.

The proposed development is unlikely to have any major effects of the presence of *Ruppia Megacarpa* in the area. Most of the development footprint is in depths > 1.5 m, outside of the depth range of *Ruppia Megacarpa*.

Full confirmation of the species would require consultation with a specialist, as there are a number of morphologically similar species that cannot be reliably distinguished in the field and may require laboratory identification. As a conservative measure, it has been assumed that *Ruppia Megacarpa* is present in the area and that it is possible a small area near the shoreline may be affected by the proposed development due to light limitation, specifically in the location of the footbridge. However, impacts on *Ruppia Megacarpa*, if present, are expected to be minimal.



Figure 5. Suspected *Ruppia Megacarpa* observed during the targeted shoreline search.

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4 Bathymetry

4.1.1 Methods

Bathymetry was mapped on 11 February 2025 and 17 April 2025 across the proposed development footprint and impact area using a GARMIN echoMAP enabled mid-band sounder with a multi-channel CHIRP chart plotter, logging GPS positions and water depth each second (Figure 6). The depths were measured to the nearest tenth of a meter, and tidally and barometrically corrected for Chart Datum (CD) and Australian Height Datum (AHD). The resultant file was interpolated using GIS software Surfer 11.0, creating a bathymetric profile of the area.

4.1.2 Results

Bathymetric mapping revealed the riverbed gradual deepens with distance from shore. On the eastern side of the footprint and buffer zone a shallow shoreline transitions into a deeper channel approximately 100 m offshore, before shallowing again. The channel reaches a maximum depth of approximately 14 m below CD.

The western portion of the development footprint becomes progressively shallower (< 1.6 m below CD) moving westward towards the inner bay. The shallowest depth recorded was approximately 0.3 m below CD, along the western shoreline. A depth contour of 1.6 m below CD has been included on the map, as advised by the client, to indicate the minimum depth likely required for vessel manoeuvring.

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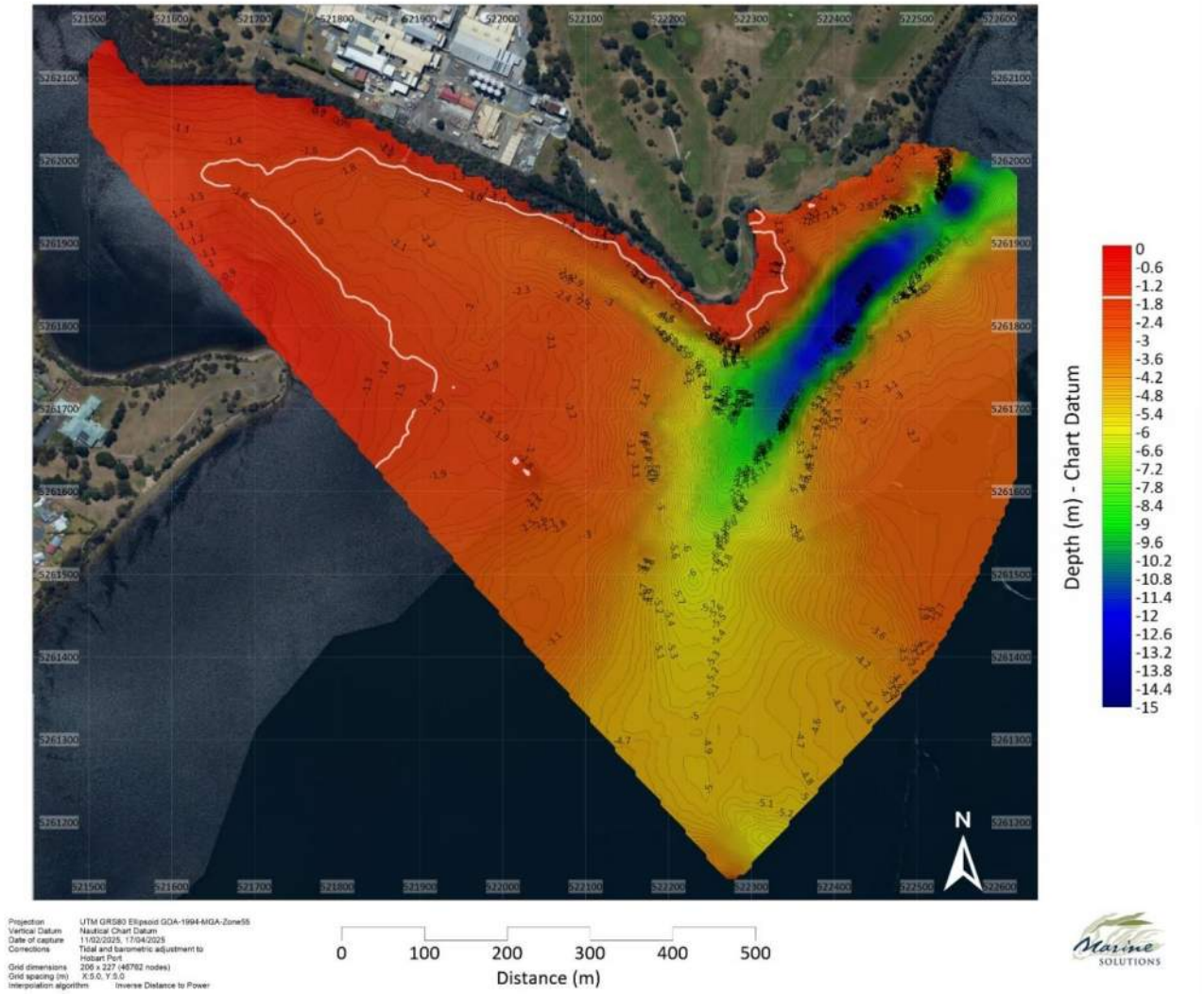


Figure 6. Bathymetric contour map of the proposed development area and surrounding buffer zone adjacent to the Cadbury Chocolate Factory. Depths have been adjusted to Chart Datum with tidal and barometric corrections applied. The white contour line represents the 1.6 m depth contour.

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5 Jet Probing

5.1.1 Methods

Soft sediment depth was measured on 11 April 2025 and 17 April 2025, at a total of 27 sites within the proposed development. A jet probe was used to assess sediment characteristics by inserting the probe into the substrate and applying high-pressure air to penetrate below the silty surface layer. The depth of sediment penetration was recorded and compared to the depth measured by the sounder, which records the surface of the substrate.

The nature of the substrate at refusal was classified based on the "feel" encountered by the probe: either 'hard resistance' (assumed to indicate hard rock) or 'soft resistance' (assumed to indicate clay or similarly compacted sediments).

5.1.2 Results

Jet probing results generally revealed increasing sediment depth from shore, ranging from 0.3 – 3.5 m (Figure 7 & Table 3). Fine and silty sediment was present at sites with soft resistance and evidenced by clay remnants on probe tip upon retrieval. The stirred-up sediment emitted a strong odour suggesting the sediment may be anaerobic below the surface.

The sites adjacent to the shoreline were characterized by hard refusal of the jet probe (< 1 m) hitting rock with little to no soft sediment cover. The greatest soft sediment build-up was generally recorded 70 m and 120 m out from shore with sediment depths reaching 3.5 m. Penetration depths are listed in Table 3.

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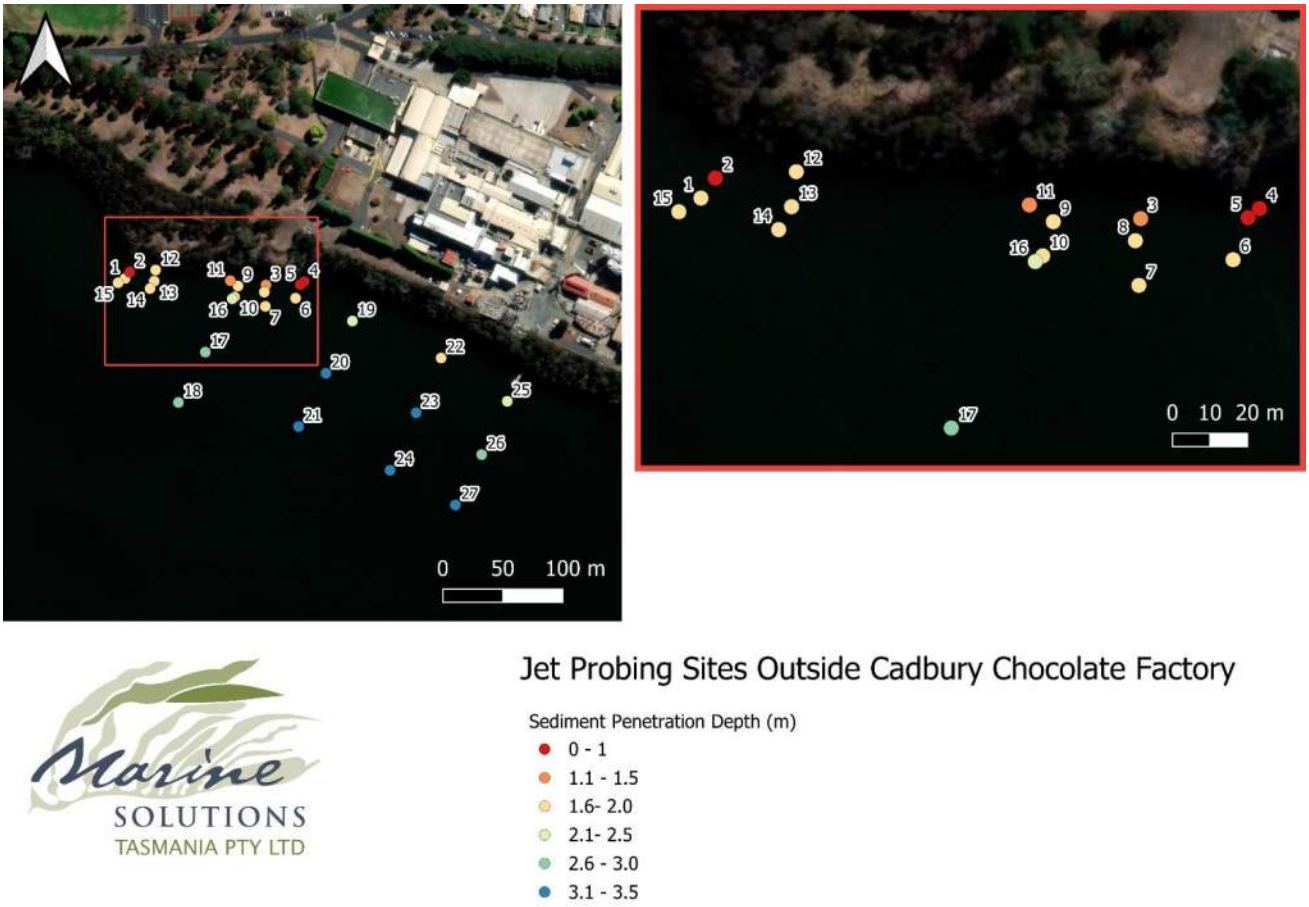


Figure 7. Map of jet probing sampling locations and corresponding depth ranges within the proposed development area (Coordinate Reference System: GDA94 / MGA Zone 55).

Table 3. Jet probing results within the proposed development area, showing the penetration depth reached by the jet probe (probe depth) and the depth recorded by the vessel sounder measuring distance from the water surface down to the seabed (water depth).

Site	Probe Depth (m)	Water Depth (m)	Odor	Notes
1	2.0	1.7		
2	1.0	1.0	General odour	Hard refusal
3	1.5	1.7		Soft silt
4	0.3	1.5		Silt

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Site	Probe Depth (m)	Water Depth (m)	Odor	Notes
5	1.0	1.8		Silt
6	2.0	1.8		Very soft silt
7	2.0	2.0		Silt
8	2.0	1.8		Silt
9	2.0	1.8		Silt
10	2.0	1.9		Soft
11	1.5	1.5		Silt
12	2.0	1.4		Edge of rock / Silt
13	2.0	1.7		Silt
14	2.0	1.7		Silt
15	2.0	1.7		
16	2.5	1.7	General odour	Soft refusal
17	3.0	2.0	General odour	Soft refusal
18	3.0	2.4	General odour	Soft refusal
19	2.5	1.8	Reduced odour	Soft refusal
20	3.5	2.2	General odour	Soft refusal
21	3.5	2.4	Reduced odour	
22	2.0	2.0	General odour	
23	3.5	2.6	General odour	
24	3.5	2.6	Reduced odour	
25	2.5	2.1	Increased odour	
26	3.0	2.8	Reduced odour	
27	3.5	2.6	Reduced odour	

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6 Habitat Characterisation

6.1 Intertidal Habitat

6.1.1 Methods

An intertidal habitat survey was conducted by marine scientists on April 7 2025 to characterize the intertidal habitat within the development area. The survey was conducted on the western side of the existing jetty, covering a total distance of approximately 500 m along the mean high tide and mean low tide marks (Figure 8). The search involved carefully examining exposed rocks, cracks, and the underside of rocks, with each rock being returned to its original position after inspection. The intertidal survey was supplemented with a survey of the sublittoral zone (see section 6.2), providing a comprehensive assessment of the intertidal ecosystem.

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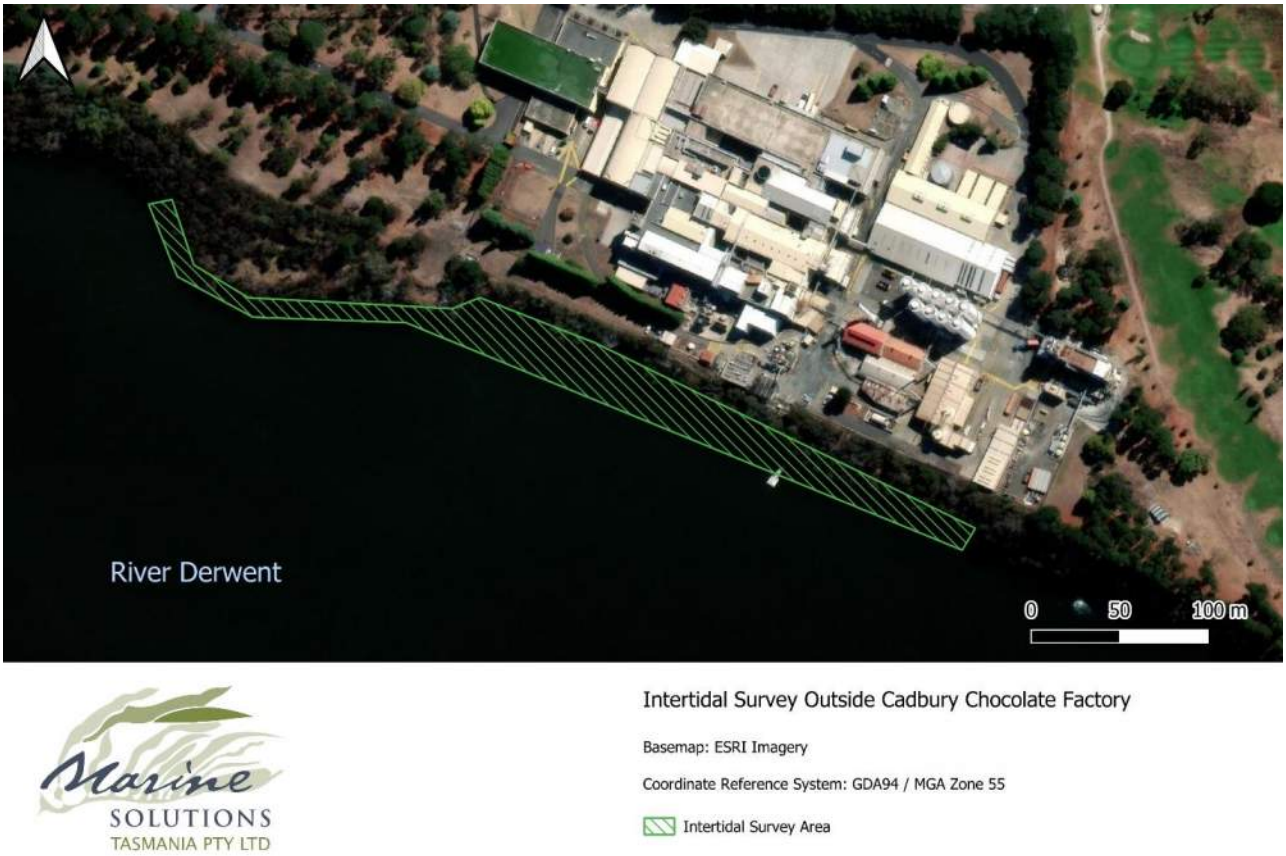


Figure 8. Map displaying the area covered in the intertidal survey.

6.1.2 Results

The intertidal area was composed of cobbles along the low to mean water mark with debris such as shopping trolleys, plastics and broken pipes scattered throughout the area. The mean high tide mark featured large pieces of driftwood and sparse patches of tussock like grass before transitioning to a steep rising bank and cliff. There were many patches of green algae (*Ulva* sp.) along the mean water mark.

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High densities of Pacific oysters (*Crassostrea gigas*) and several mussels were observed in the sublittoral zone and at the low water mark. Mottled shore crabs, spotted shore crabs, conniwinks, barnacles, tube worms (*Galeolaria* sp.), drift algae and seagrass were observed at the low water mark.

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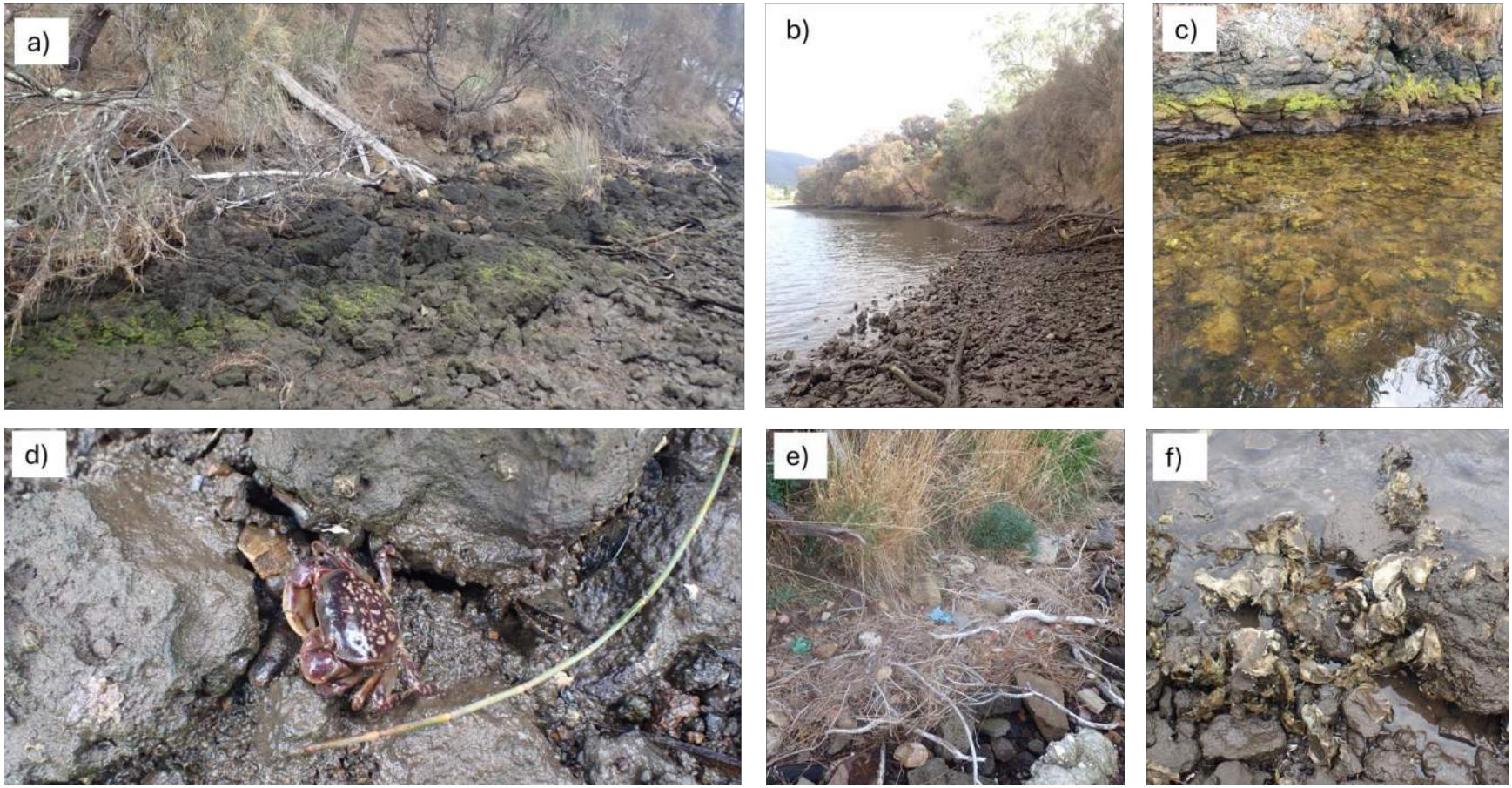


Figure 9. Typical habitats and species observed in the intertidal survey a) driftwood and green algae along the mean to high water mark; b) cobbles dispersed around the low to mean water mark; c) cobbles and Pacific oysters in the sublittoral zone; d) mottled shore crab at the low water mark; e) debris and driftwood along the mean water mark; f) high densities of Pacific oysters in the low and sublittoral zones.

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6.2 Subtidal Habitat

6.2.1 Methods

A subtidal habitat survey was conducted by marine scientists on April 11 2025 to supplement the intertidal survey, providing a comprehensive assessment of the intertidal ecosystem and sublittoral zone. The subtidal survey was conducted along four 100 m transects using a towed underwater video camera frame with a GoPro 8 and a Sony STARVIS IMX307 CMOS downward-facing camera. Each transect ran perpendicular to the shoreline, starting approximately 20 m from shore and extending out to 120 m (Figure 10).

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Figure 10. Map displaying the transects conducted during the subtidal survey and the sediment sampling locations.

6.2.2 Results

Visibility during the survey was very poor, making it difficult to observe the seabed clearly. However, along all transects, the substrate consisted of unconsolidated fine silty sediment, with extensive bioturbation and small scattered shell fragments. A few sparse patches of seagrass were observed along the transects, with decreasing densities further east (along Transects C and D).

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Figure 11. Images showing the silty, bioturbated habitat observed across all transects during the subtidal survey.

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7 Sediment

7.1 Contaminants

7.1.1 Methods

Duplicate sediment samples were collected at four sites 70 m from shore to assess existing conditions and establish a baseline for contaminants. Each sampling site was located along the subtidal transects A-D (Figure 10). Contaminants that were chosen for analysis included heavy metals and metalloids and total petroleum hydrocarbons (TPH). Sediment samples were collected on 11 April 2025 using a ponar grab. The top layer of sediment was transferred into clean laboratory glassware and sent to Analytical Services Tasmania (AST), NATA accredited laboratory, for analysis. All samples were tested for the following parameters

- Metals (As, Cd, Cr, Co, Cu, Pb, Mn, Ni, Zn)
- Total Petroleum Hydrocarbons (TPH)

Laboratory results for the above parameters were then compared to the Australian and New Zealand Guidelines (ANZG) toxicant default guideline values for sediment quality (ANZG 2018).

The default guideline values for sediment quality (DGVs) indicate the concentrations below which there is a low risk of unacceptable effects occurring, and should be used, with other lines of evidence, to protect aquatic ecosystems. In contrast, the 'upper' DGVs provide an indication of concentrations at which one might already expect to observe toxicity-related adverse effects (Table 4)

7.1.2 Results

Results of the sediment contaminant analysis is listed in Table 4 below. All sediment samples exceeded the ANZG DGV 'upper trigger' for cadmium, lead and zinc indicating high toxicity. 70m B to 70 m D also exceeded the ANZG DGV 'upper trigger' for Arsenic while 70 m A exceeded the lower trigger. All sediment samples also exceeded the ANZG DGV 'lower trigger' for copper indicating there is a risk of unacceptable effects occurring. Total petroleum hydrocarbons were low across all sites.

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Table 4. Summary of results of sediment contaminant testing, compared against the ANZG (2018) toxicant default guideline values where applicable. Light orange highlight indicates the lower trigger has been exceeded whereas dark orange indicates the upper trigger has been exceeded.

		Units	ANZECC/ARMCANZ Default Guideline Values		Results							
			Lower trigger	Upper trigger	70 m A1	70 m A2	70 m B1	70 m B2	70 m C1	70 m C2	70 m D1	70 m D2
	Moisture content	%										
Metals	Arsenic	mg/kg DMB	20	70	59	66	93	127	177	107	101	76
	Cadmium	mg/kg DMB	1.5	10	24.6	24	28.3	35.9	30.5	17.9	19.7	14.7
	Chromium	mg/kg DMB	80	370	39	36	35	39	36	34	33	31
	Cobalt	mg/kg DMB	-	-	9	9	9	11	11	10	9	9
	Copper	mg/kg DMB	65	270	137	134	165	207	168	108	112	89
	Lead	mg/kg DMB	50	220	563	545	633	831	835	496	538	401
	Manganese	mg/kg DMB	-	-	149	138	147	174	269	221	212	186
	Nickel	mg/kg DMB	21	52	20	18	18	20	20	20	18	17
	Zinc	mg/kg DMB	200	410	2170	2190	2760	3710	4090	2350	2430	1760
Total Petroleum Hydrocarbons	TPH C06-C09	mg/kg DMB	-	-	<25	<25	<25	<25	<25	<25	<25	<25
	TPH C10-C14	mg/kg DMB	-	-	<100	<100	<25	<25	<25	<25	<25	<25
	TPH C15-C28	mg/kg DMB	-	-	<100	<100	<100	<100	<100	<100	<100	<100
	TPH C29-C36	mg/kg DMB	-	-	<100	<100	<100	<100	<100	<100	<100	<100
	TPH Sum C6-C36	mg/kg DMB	-	-	<100	<100	<100	<100	<100	<100	<100	<100

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7.2 Particle Size

7.2.1 Methods

Samples for particle size analysis were collected on 11 April 2025 at the same four sediment sites as the sediment contaminant samples (Figure 10). Samples were collected using a ponar grab, transferred into clean glassware and transported to Marine Solutions for in-house analysis. Sediment particle size distribution was assessed volumetrically for each site by washing samples through a series of sieves (4 mm, 2 mm, 1 mm, 500 µm, 250 µm, 125 µm and 63 µm).

The content of each sieve was drained completely of water and transferred to a measuring cylinder, beginning with the coarsest sediment fraction (4 mm), and working down to the finest (63 µm) and the volume of each recorded. The sediment fraction < 63 µm was assumed to be the total volume of the sediment sample minus the combined volume of all other sediment size classes. In situations where the combined volume was greater than the initial volume due to large non-sediment particulates in the sample, the sediment fractions were proportionately reduced by the total percentage of non-sediment particulates in the sample.

7.2.2 Results

Sediment samples collected from the four sites showed minor variation in particle size distribution (Figure 12). Fine sand and silt (<0.25 mm) were the dominant components at most sites. Sites A and B contained the highest proportions of fine sand (0.063–0.25 mm), while Site D had the greatest proportion of coarse sand (>0.5 mm). Overall, finer sediments were more prevalent in the western sites, with coarser sediment increasing toward the east.

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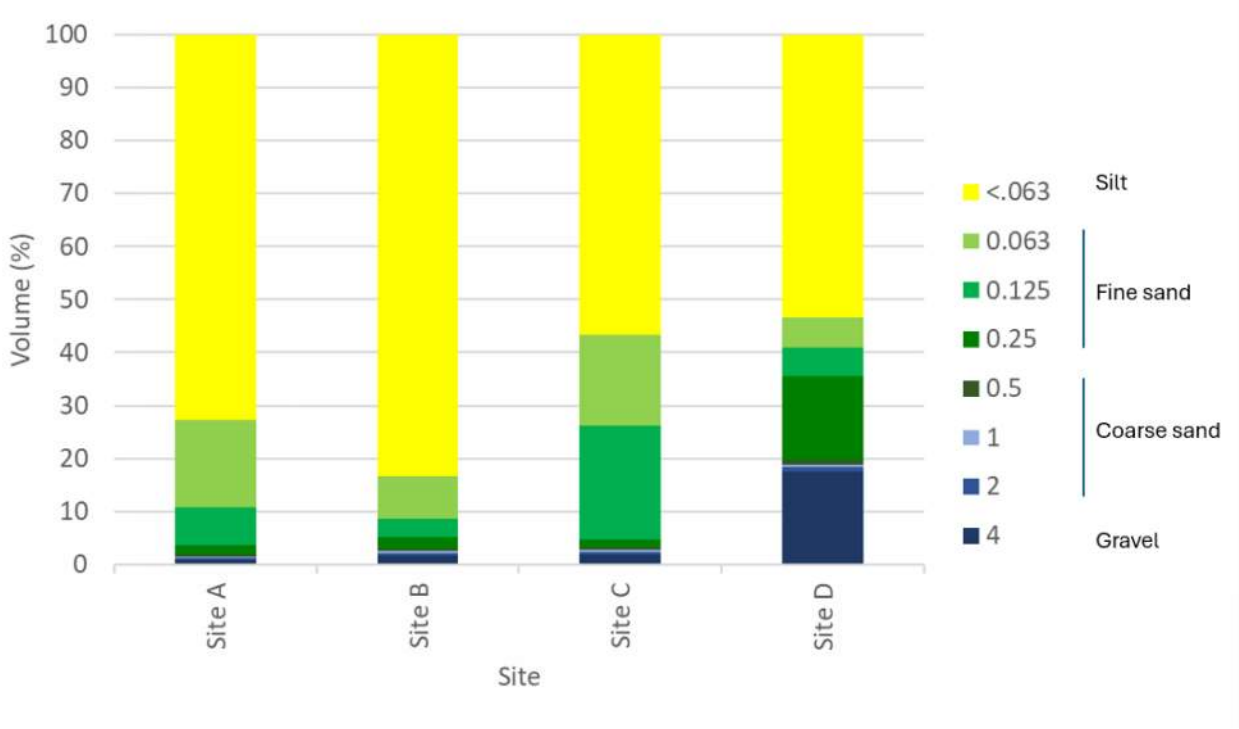


Figure 12. Particle size distribution of sediments at Site A – D.

7.3 Settlement Rate

7.3.1 Methods

Samples for settlement rate analysis were obtained 70 m from shore at the same sites as the sediment contaminants (sites A, B, C and D) (Figure 10). Settlement rate samples contained sediment homogenised and distributed into 200 mL glass jars from each site. The settlement rate analysis was conducted in the Marine Solutions laboratory on 7 May 2025. For each sediment sample, a measured amount (200 mL) of sediment was mixed with 1 L of water collected from the Derwent Estuary in a large clear glass jar. Each sample was mixed thoroughly. A photo of each sample was then taken at the start (0 hours), 5 minute, 10 minute, 20 minute, 40 minute, 1 hour, 2 hour, 3 hour, 4 hour, 24 hour and 48 hour intervals to determine the rate of settlement. Images were cropped and adjusted for brightness (+40%) to effectively visualise the portion of settled sediment.

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7.3.2 Results

Sediment settlement patterns were similar across all four sampling locations, with a slight gradient from lower-energy, depositional conditions in the west (Sites A and B) to more wave-impacted, higher-energy conditions in the east (Sites C and D). Sediments from the western sites showed a slightly higher proportion of fine silt, which settled gradually over several hours. While coarser material settled relatively quickly after agitation, low levels of turbidity persisted for up to 24 hours with little observable change between the 24- and 48-hour mark (Figure 13 and Figure 14).

In comparison, sediments from the eastern sites also followed this general pattern, with coarse particles settling rapidly and finer material dispersing more gradually. However, the higher proportion of coarse sediment at these sites meant overall turbidity decreased more quickly following agitation. After approximately 4 hours most sediment had already settled.

These results suggest that sediment mobilisation during construction may lead to temporary plumes in the surrounding environment, with suspended material from the western sites potentially taking longer to settle completely from the water column.

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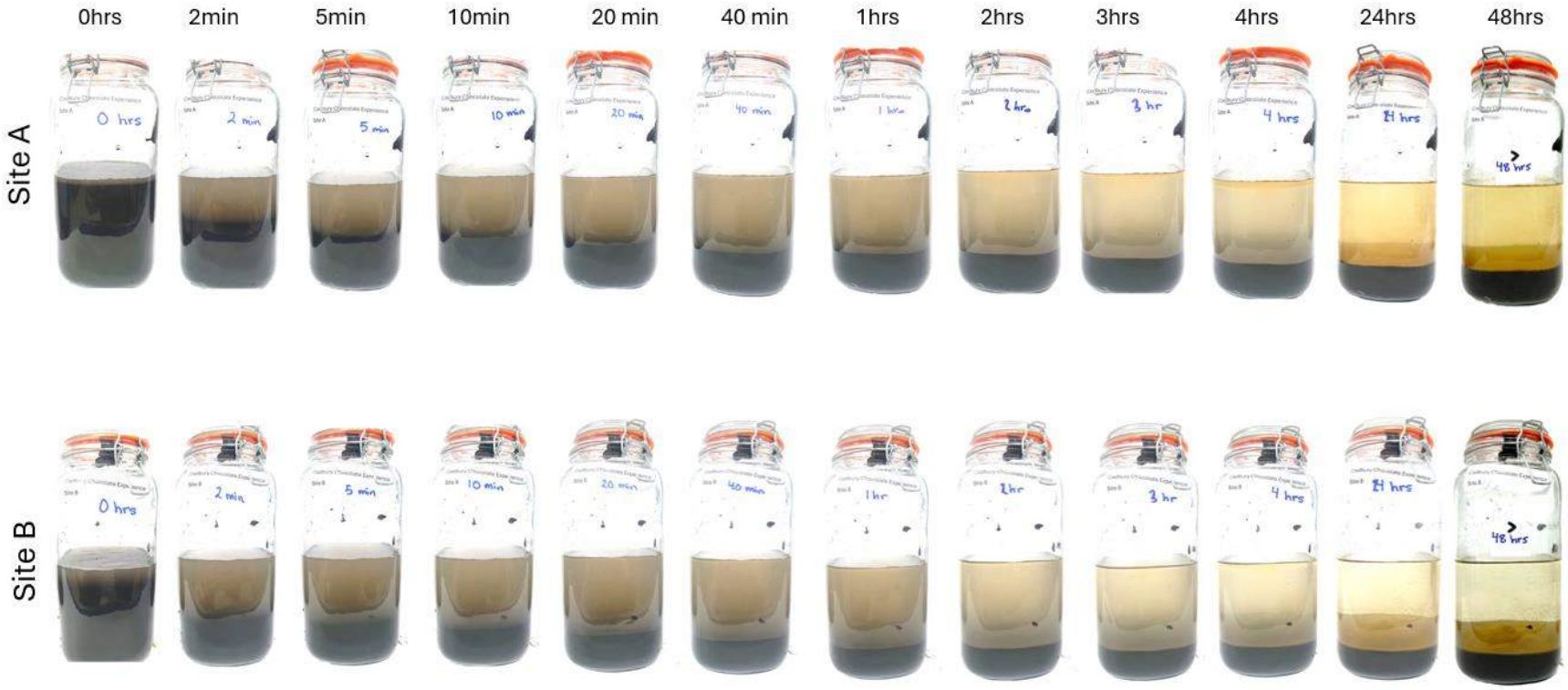


Figure 13. Site A and B sediment settlement analysis results.

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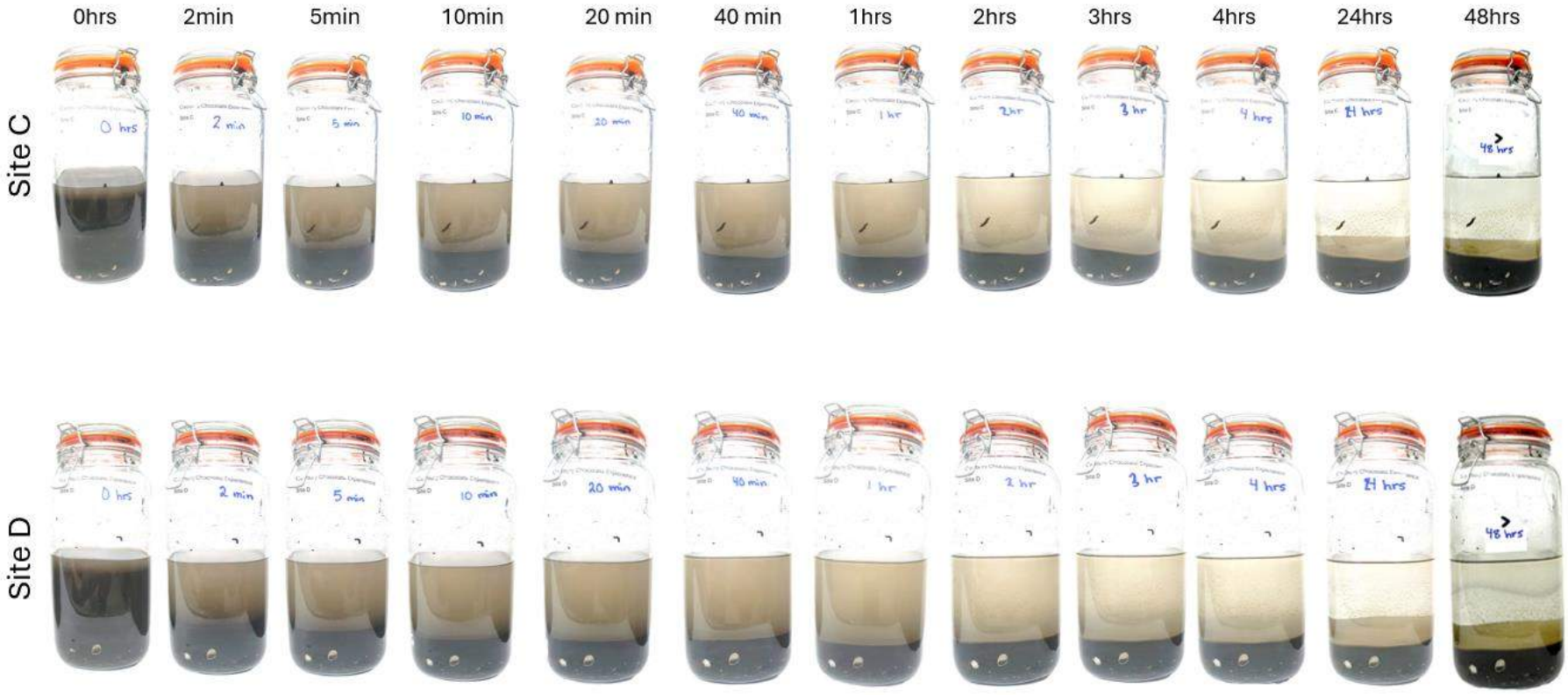


Figure 14. Site C and D sediment settlement analysis results.

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8 Conclusions & Recommendations

The proposed scope of building a new berthing facility and associated infrastructure is expected to have minimal impact on marine environmental values. However, the ongoing operation of vessels in the area poses a high environmental risk, as vessel movements are likely to resuspend sediments known to contain high elevated levels of toxic metals. The information presented in this document is intended to support informed planning and management during the construction phase, helping to reduce the likelihood or extent of potential environmental impacts.

8.1 Threatened Marine Species

Eight threatened marine species have been identified as potentially occurring within the area; however, significant impacts are not anticipated. If the development involves the use of impulsive sound sources (e.g., piling), it is recommended that a 300 m exclusion zone be established around the construction site. This zone should be actively monitored for the presence of marine mammals before and during construction activities. If any marine mammals are observed within the exclusion zone, works should cease until no animals have been sighted for at least 30 minutes. A gradual start-up of construction activities is also advised to minimise acoustic shock and give animals the opportunity to leave the area. Nevertheless, due to the sheltered and shallow nature of the site, interactions with marine mammals are considered unlikely.

The large-fruit sea tassel (*Ruppia Megacarpa*) was the only species in the desktop based assessment with specific survey requirements, prompting a targeted species survey. The targeted species survey suggests that small amounts of *Ruppia Megacarpa* are likely present in very shallow water (< 50 cm) near the shoreline, alongside patches of seagrass. However, definitive identification would require confirmation by a specialist as there are a number of morphologically similar species that cannot be reliably distinguished in the field and may require laboratory identification. However, most observed fragments were not attached to the substrate and had likely drifted into the area from upstream.

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As a precautionary measure, it has been assumed that *Ruppia Megacarpa* is present in the area and that a small zone, particularly near the proposed footbridge, may be affected by light limitation associated with the development. However, as the majority of the proposed works will be located in areas deeper than 1.5 m—outside the depth range where *Ruppia Megacarpa* was observed, any potential impact on this species is therefore expected to be minimal.

8.2 Biosecurity

The intertidal and subtidal survey observed no threatened or protected species. A small number of introduced marine species were observed in the intertidal zone however, their presence was expected and not considered a cause for concern. However, any large rocks removed from the seabed should be properly disposed of and not relocated to any water catchment outside of the Derwent Estuary. This precaution is necessary to prevent the translocation of these species.

Similarly, machinery, including vessels which have been used in waters other than the Derwent Estuary should be washed thoroughly with fresh water to remove any sediment. Machinery and vessels which have the potential to transport waterborne viruses or pest species should be disinfected and allowed to dry prior to being used on site.

Existing protocols (*Living Marine Resources Act 1995*) should be followed to ensure no marine species are translocated and construction equipment should ideally be sourced from within the Derwent Estuary.

8.3 Sediment Suspension

The seabed in the western portion of the development footprint is characterised by cobbles and rocks near the shoreline, transitioning to fine silt further offshore. Bathymetric data indicates progressively shallower depths (< 1.6 m below chart datum) toward the inner bay in the west. In contrast, the eastern side of the footprint transitions into a deeper channel approximately 100 m offshore before shallowing again. It's important to note that the bathymetric map has been

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barometrically corrected to Chart Datum, which represents the lowest astronomical tide. As a result, water levels will typically be higher than those shown on the map under normal tidal conditions.

Jet probing and particle size results indicate that the seabed consists predominantly of fine silt, with sediment depths of up to 3.5 m recorded at sites approximately 70–120 m offshore. In contrast, probing close to the shoreline encountered hard refusal at depths of less than 1 m, indicating exposed rock with minimal sediment cover.

Sediment sampling revealed concentrations of cadmium, lead, and zinc exceeding the ANZG default guideline value (DGV) 'upper trigger' levels at all sites, indicating a potential for toxicity-related adverse effects. Arsenic concentrations exceeded the upper trigger level at sites 70 m B to 70 m D, while levels at 70 m A exceeded the lower trigger. In addition, all samples exceeded the lower trigger levels for copper, suggesting a risk of unacceptable ecological effects. This was expected given the history of the Derwent River's exposure to various environmental pollutants, including heavy metals. It is also evident from the debris observed on site, signs of nutrient enrichment, and sediment contaminants that the site is already moderately impacted by anthropogenic activity.

The particle size and settlement rate results showed that finer sediments were more prevalent in the western sites, with slightly coarser sediment increasing toward the east. Most sediment appeared to have settled within 24 hours at all sites, with faster settling observed at the eastern sites, where the majority of material had settled after just 4 hours.

Overall, the western sites are slightly shallower and characterised by a higher percentage of finer particles which may elevate turbidity and release greater number of contaminants in the water column. However, the differences between western and eastern sites are relatively minor. This implies that the environmental implications of the proposed development are broadly similar across the area and unlikely to differ significantly between sites.

As the environmental risks of sediment resuspension from construction activities differ from those associated with ongoing vessel operations, the following sections outline the potential impacts and considerations for each.

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8.3.1 Impacts and Mitigation of the Proposed Berthing Facility and Associated Infrastructure

It is recommended that a silt screen be used during construction activities associated with the new berthing facility and infrastructure, particularly for works that may cause sediment resuspension such as piling. In addition, piling should ideally be carried out during calm conditions, on an outgoing tide, and/or when offshore winds are present. Timing pile-driving activities to coincide with favourable weather conditions can help minimise the extent and impact of sediment plumes on the surrounding environment.

8.3.2 Impacts of Ongoing Vessel Operations

The ongoing operation of vessels in the area may present a high environmental risk due to the mobilisation of sediments containing elevated concentrations of metals. Fine sediments are easily resuspended by propeller wash in shallow areas and because of their large surface area, can bind contaminants that may become bioavailable to aquatic organisms. Additionally, jet probing of sediments revealed anaerobic conditions beneath the surface, indicating that initial vessel activity may release odours and contaminants into the water column. Settlement rates suggest suspended contaminants could remain in the water for at least 24 hours in worst-case scenarios, prolonging exposure and increasing ecological risk.

The spatial extent of these impacts remains uncertain, as plume behaviour will likely vary depending on environmental factors such as tidal phase, current velocity, and wind conditions. Further investigation would therefore be required to define this more precisely.

To mitigate these risks and reduce the potential for sediment disturbance, the use of vessels with a shallow draught and/or lateral motor propellers such as the MR-1 should be prioritised (see Section 1.4). These vessel types are designed to minimise sediment resuspension by reducing propeller wash near the seabed and limiting underwater obstructions. Vessels without thrusters are also recommended as thrusters tend to stir up sediments in shallow areas. If feasible, dredging in key operational areas could also be considered to stabilise sediment and reduce resuspension risk.

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With these mitigation measures implemented, the environmental risk associated with vessel operations can be substantially lowered, reducing potential impacts on water quality, underwater habitats and aquatic species.

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10 Appendices

Appendix 1. EPBC Protected Matters Summary

Summary of the *EPBC Act* PMST findings within 5000 m and 500 m of the project.

	Item	5000 m buffer		500 m buffer		Cross-reference Section of this report
		# ID'd by PMST	Incl. # aquatic matters	# ID'd by PMST	Incl. # aquatic matters	
Matters of National Environmental Significance	**World Heritage Properties**	0	0	0	0	N/A
	National Heritage Places	0	0	0	0	N/A
	Wetlands of International Importance	1	1	0	0	N/A
	Great Barrier Reef Marine Park	0	0	0	0	N/A
	Commonwealth Marine Area	0	0	0	0	N/A
	Listed Threatened Ecological Communities	4	0	2	0	Section 2.1
	Listed Threatened Species	60	2	51	1	Section 2.1
	Listed Migratory Species	28	1	28	1	Section 2.1
	Nuclear actions	*Not listed by PMST – none known.*				N/A
	Water resources	*Not listed by PMST – none known.*				N/A
Other Matters Protected by EPBCA	Commonwealth Land	11	0	6	0	N/A
	Commonwealth Heritage Places	0	0	0	0	N/A
	Listed Marine Species	36	0	36	0	N/A
	Whales and Other Cetaceans	0	0	0	0	N/A
	Critical Habitats	0	0	0	0	N/A
	Commonwealth Reserves Terrestrial	0	0	0	0	N/A
	Commonwealth Reserves Marine	0	0	0	0	N/A
	Habitat critical to survival of marine turtles	0	0	0	0	N/A
Extra Information	State and Territory Reserves	7	1	1	1	N/A
	Regional Forest Agreements	1	0	1	1	N/A
	Nationally Important Wetlands	1	1	0	0	N/A
	EPBC Act Referrals	4	0	2	0	N/A
	Key Ecological Features	0	0	0	0	N/A
	Biologically Important Areas	5	0	5	0	N/A
	Bioregional Assessments	0	0	0	0	N/A
	Geological and Bioregional Assessments	0	0	0	0	N/A

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Appendix 2. Operational Summary

Date	Personnel	Time (start)	Time (end)	Cloud	Rain	Swell	Wind	Tide	Works conducted
11/02/2025	K. Burgess E. Foster	10:00	12:00	7/8	Yes	Calm	Calm	Outgoing	- Bathymetry (eastern side of the footprint)
7/04/2025	E. Johnson K. MacAdie	09:00	11:00	6/8	-	Calm	10 kts SW	Outgoing	- Intertidal Survey
11/04/2025	E. Johnson L. Harrison J. Watling	09:00	12:30	1/8	-	Calm	5-10 kts SW	High tide	- *Ruppia Megacarpa* survey - Jet probing - Subtidal habitat characterization - Sediment sampling
17/04/2025	E. Johnson S. Ibbott	10:00	11:30	2/8	-	Calm	Calm	Low incoming	- Bathymetry (western side of the footprint) - Jet probing

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Appendix 3. GPS Positions of sampling locations

Name	Zone	Easting	Northing	Notes
Intertidal Survey Start	55G	521531.52	5262154.83	
Intertidal Survey End	55G	521987.53	5261964	
Ruppia Megacarpa Quadrat 1	55G	521649.4	5262073	
Ruppia Megacarpa Quadrat 2	55G	521637.9	5262075	
Ruppia Megacarpa Quadrat 3	55G	521643.6	5262077	
Ruppia Megacarpa Quadrat 4	55G	521650.1	5262079	
Ruppia Megacarpa Quadrat 5	55G	521656.8	5262079	
Ruppia Megacarpa Quadrat 6	55G	521660.8	5262077	
Ruppia Megacarpa Quadrat 7	55G	521667.2	5262076	
Ruppia Megacarpa Quadrat 8	55G	521670.2	5262072	
Ruppia Megacarpa Quadrat 9	55G	521671.9	5262069	
Ruppia Megacarpa Quadrat 10	55G	521678.2	5262066	
Ruppia Megacarpa Quadrat 11	55G	521681.2	5262062	
Ruppia Megacarpa Quadrat 12	55G	521685	5262061	
Ruppia Megacarpa Quadrat 13	55G	521690.2	5262060	
Ruppia Megacarpa Quadrat 14	55G	521695.9	5262057	
Ruppia Megacarpa Quadrat 15	55G	521700.9	5262055	
Ruppia Megacarpa Quadrat 16	55G	521703.7	5262054	
Ruppia Megacarpa Quadrat 17	55G	521710	5262052	
Ruppia Megacarpa Quadrat 18	55G	521713.6	5262051	
Ruppia Megacarpa Quadrat 19	55G	521719.8	5262050	
Ruppia Megacarpa Quadrat 20	55G	521725.2	5262049	
Ruppia Megacarpa Quadrat 21	55G	521729.5	5262047	
Ruppia Megacarpa Quadrat 22	55G	521734.4	5262046	
Ruppia Megacarpa Quadrat 23	55G	521739.6	5262044	
Ruppia Megacarpa Quadrat 24	55G	521742.9	5262041	
Ruppia Megacarpa Quadrat 25	55G	521747.3	5262040	
Ruppia Megacarpa Quadrat 26	55G	521752	5262038	
Ruppia Megacarpa Quadrat 27	55G	521757.2	5262035	
Ruppia Megacarpa Quadrat 28	55G	521760	5262033	
Ruppia Megacarpa Quadrat 29	55G	521765.1	5262029	
Ruppia Megacarpa Quadrat 30	55G	521769.1	5262027	
Ruppia Megacarpa Quadrat 31	55G	521774.1	5262024	
Ruppia Megacarpa Quadrat 32	55G	521777.9	5262021	
Ruppia Megacarpa Quadrat 33	55G	521780.8	5262018	

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Ruppia Megacarpa Quadrat 34	55G	521785.5	5262015
Ruppia Megacarpa Quadrat 35	55G	521790.8	5262012
Ruppia Megacarpa Quadrat 36	55G	521795.2	5262009
Ruppia Megacarpa Quadrat 37	55G	521798.7	5262008
Ruppia Megacarpa Quadrat 38	55G	521800.6	5262006
Ruppia Megacarpa Quadrat 39	55G	521804	5262006
Ruppia Megacarpa Quadrat 40	55G	521810.5	5262006
Ruppia Megacarpa Quadrat 41	55G	521815	5262005
Ruppia Megacarpa Quadrat 42	55G	521819.9	5262005
Ruppia Megacarpa Quadrat 43	55G	521824.3	5262004
Ruppia Megacarpa Quadrat 44	55G	521830.5	5262002
Ruppia Megacarpa Quadrat 45	55G	521834.3	5262001
Ruppia Megacarpa Quadrat 46	55G	521838.1	5261997
Ruppia Megacarpa Quadrat 47	55G	521843.5	5261993
Ruppia Megacarpa Quadrat 48	55G	521846.7	5261990
Ruppia Megacarpa Quadrat 49	55G	521847.2	5261989
Ruppia Megacarpa Quadrat 50	55G	521852.1	5261986
Ruppia Megacarpa Quadrat 51	55G	521856.4	5261983
Ruppia Megacarpa Quadrat 52	55G	521862.6	5261981
Ruppia Megacarpa Quadrat 53	55G	521869.7	5261979
Ruppia Megacarpa Quadrat 54	55G	521879.2	5261973
Ruppia Megacarpa Quadrat 55	55G	521887.7	5261969
Ruppia Megacarpa Quadrat 56	55G	521889.1	5261969
Subtidal Transect A Start	55G	521647.8	5262070.87
Subtidal Transect A End	55G	521603	5261984.64
Subtidal Transect B Start	55G	521747.92	5262052.36
Subtidal Transect B End	55G	521703.12	5261964.59
Subtidal Transect C Start	55G	521821.88	5262021.59
Subtidal Transect C End	55G	521779.33	5261928.26
Subtidal Transect D Start	55G	521876.97	5261985.63
Subtidal Transect D End	55G	521833.76	5261899.4
Sediment Site A	55G	521625.39	5262026.52
Sediment Site B	55G	521725.97	5262008.94
Sediment Site C	55G	521801.06	5261976
Sediment Site D	55G	521855.7	5261941.28
Jet probing Site 1	55G	521558.6	5262088
Jet probing Site 2	55G	521562.4	5262093
Jet probing Site 3	55G	521564	5262097

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Jet probing Site 4	55G	521576.1	5262092
Jet probing Site 5	55G	521590.7	5262092
Jet probing Site 6	55G	521617.7	5262087
Jet probing Site 7	55G	521620.8	5262087
Jet probing Site 8	55G	521629.8	5262086
Jet probing Site 9	55G	521652.8	5262088
Jet probing Site 10	55G	521675.9	5262082
Jet probing Site 11	55G	521679.8	5262084
Jet probing Site 12	55G	521699.3	5262078
Jet probing Site 13	55G	521707.7	5262085
Jet probing Site 14	55G	521704.6	5262083
Jet probing Site 15	55G	521700.6	5262071
Jet probing Site 16	55G	521675.5	5262065
Jet probing Site 17	55G	521674.5	5262076
Jet probing Site 18	55G	521677	5262085
Jet probing Site 19	55G	521652.6	5262081
Jet probing Site 20	55G	521649.8	5262072
Jet probing Site 21	55G	521646.2	5262086
Jet probing Site 22	55G	521560.3	5262100
Jet probing Site 23	55G	521584.7	5262094
Jet probing Site 24	55G	521584	5262095
Jet probing Site 25	55G	521582.8	5262085
Jet probing Site 26	55G	521579.3	5262079
Jet probing Site 27	55G	521552.7	5262084

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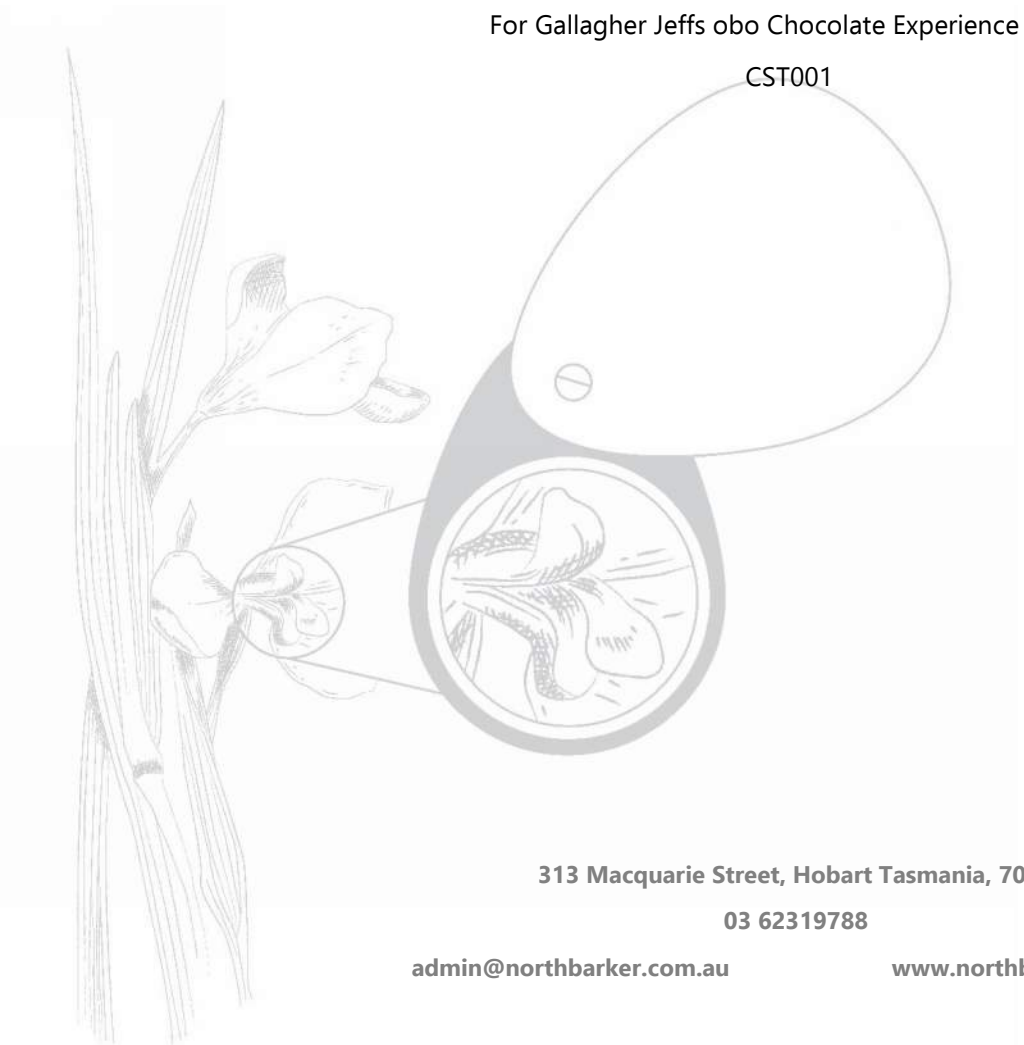
Chocolate Experience at Cadbury

NATURAL VALUES ASSESSMENT

9th September 2025

For Gallagher Jeffs obo Chocolate Experience No. 2

CST001



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ACKNOWLEDGEMENTS

Project Name	Chocolate Experience at Cadbury
Location	Cadbury Road, Claremont
Proponent	Chocolate Experience No. 2 (a trading company established by Simon Current and Associates and partner investors)
Proponent Contact	Michelle Mhemba (Gallagher Jeffs)
NBES Job Code	CST001
NBES Project Manager	Tim Leaman (BSc Hons)
NBES Project Summary	Sally Anthony (BSc)
Reporting	Sally Anthony (BSc)
Mapping	Liam Andrews

Version	Date	Author & Comment	Position
Version 0.1	19/06/2025	Sally Anthony - draft	Ecologist
Version 1.0	20/06/2025	Tim Leaman – edits and provision to client	Director/Principal Ecologist
Version 1.1	04/09/2025	Tim Leaman – additions regarding bird strike risk and update figures	Director/Principal Ecologist
Version 1.2	09/09/2025	Tim Leaman – edits in response to client comments of 09/09/2025	Director/Principal Ecologist

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SUMMARY

Property Details	
Address	100 Cadbury Road, Claremont, Tasmania.
Title Reference / PID Number	PID: 2245343
Tasmanian Planning Scheme Zones	General Industrial Zone (Zone 19) & Environmental Management Zone (Zone 23)
Tasmanian Planning Scheme Code Overlays	Priority Vegetation Area Code Overlay & Waterway and Coastal Protection Area Code Overlay
Natural Values	
Threatened vegetation	None identified
Threatened flora	None identified
Threatened fauna and fauna habitat	Potential habitat for EPBC Act-listed species (swift parrot, blue-winged parrot, eastern barred bandicoot)
Weeds and pathogens	Four declared weeds including blackberry, boneseed, fennel & slender thistle.
Geoconservation sites	Nil
Impacts	
Add in applicable natural values impacts	Clearing of native vegetation may impact potential fauna habitat. Avoidance of the nesting tree and adherence to erosion, sediment, and weed control measures will mitigate residual impacts.
Legislative Implications	
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*	Potential habitat for EPBC-listed fauna present, significant impact not anticipated if nesting tree is avoided. Final assessment pending project design.



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Tasmanian *Threatened Species Protection Act 1995*	Additional targeted spring flora surveys recommended. Permit may be required if threatened species or active fauna habitat features are found.
Tasmanian *Nature Conservation Act 2002*	Nil
Tasmanian *Biosecurity Act 2019*	Implement weed and hygiene measures to manage declared species.

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Summary

Introduction

Gallagher Jeffs, representing Chocolate Experience No. 2, is facilitating the planning approvals process for the proposed Chocolate Experience at Cadbury. The project area spans approximately 1.33 ha and is situated adjacent to the Windermere Bay section of the River Derwent, south of the Cadbury factory service road. North Barker Ecosystem Services (NBES) has been engaged to conduct a natural values assessment (NVA) to identify and recommend measures to mitigate impacts on threatened natural values, particularly those protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) and the Tasmanian *Threatened Species Protection Act 1995* (TSPA).

Vegetation Communities

The following TASVEG communities have been identified within the project area:

- *Allocasuarina verticillata* forest (NAV) – 0.63 ha
- Urban areas (FUR) – 0.70 ha

All native vegetation within the project area is classified as *Allocasuarina verticillata* forest (NAV), covering approximately 0.63 ha. This community is not listed as a threatened vegetation type under the *Nature Conservation Act 2002*. The remainder of the site is classified as urban areas (FUR), which comprises cleared and modified land.

Threatened Flora

No threatened flora were recorded within the project area during surveys; however, *Vittadinia gracilis* and *V. muelleri* (both TSPA-listed rare species) have multiple records nearby, including sites within 400 m, across Windermere Bay. Surveys occurred outside their peak flowering period, targeted surveys during November to May are recommended to confirm their presence or absence and avoid unintentional impacts.

Threatened Fauna and Fauna Habitat

Potential habitat for several threatened fauna species was identified, including swift parrot, blue-winged parrot, and eastern barred bandicoot. A hollow-bearing tree with potential nesting habitat for parrots is present and should be avoided if possible. Loss of native vegetation is expected to have negligible impact on eastern barred bandicoot due to habitat availability in the surrounding landscape. Avoidance of the potential nesting tree for parrots is a priority.

Weeds and Pathogens

Four declared weed species including blackberry, boneseed, fennel, and slender thistle were recorded. These species are classified as Zone B weeds in the Hobart municipality, requiring containment measures. Environmental weeds such as radiata pine are also present and should be managed via staged removal, particularly near native vegetation and the foreshore. Best practice weed and hygiene management plans, including vehicle washdown protocols and monitoring, are recommended to prevent weed spread.

Legislative Implications

Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Potential habitat for several EPBC Act-listed fauna species has been identified within the project area, including the swift parrot, blue-winged parrot, and eastern barred bandicoot. A significant impact to any of these species under the EPBC Act is not currently anticipated; however, this assessment will be reviewed once the design footprint is finalised. The nesting tree should be avoided.

Tasmanian *Threatened Species Protection Act 1995*

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Vittadinia gracilis and *V. muelleri* are listed as rare under the Act. Surveys were conducted outside their peak flowering periods, so their presence cannot be ruled out. Targeted surveys during the flowering season are recommended to confirm absence and avoid unintentional impact. If active burrows or dens are discovered during pre-clearance surveys, a permit under the Act will be required.

Tasmanian *Nature Conservation Act 2002*

No threatened vegetation communities are located within the project area, and the project will therefore not be assessed under the Landuse Planning Approvals Act in relation to threatened/priority vegetation.

Tasmanian *Biosecurity Act 2019*

The proposed weed and hygiene measures included in this report should be followed to ensure compliance.

Tasmanian Planning Scheme – Launceston

The majority of the project area is zoned General Industrial (Zone 19), with a narrow shoreline section within the Environmental Management Zone (Zone 23). The area is subject to both the Priority Vegetation Area and Waterway and Coastal Protection Area overlays under the Natural Assets Code.

Priority Vegetation Area

The vegetation present is not considered to be priority vegetation, provided the potential nesting tree is retained and no threatened flora is identified. As such, assessment against the performance criteria of the overlay is not required.

Waterway and Coastal Protection Area

It is understood that development within the overlay area will be limited to the construction of a walkway. Based on the location and nature of the proposed development, significant impacts to the overlays are not anticipated. Any residual impacts can be mitigated through adherence to best practice erosion and sediment control and construction guidelines.

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1. INTRODUCTION

1.1. BACKGROUND

Gallagher Jeffs (on behalf of Chocolate Experience No. 2) is facilitating the planning approvals process for the proposed Chocolate Experience at Cadbury. The project area (Figure 1) covers approximately 1.33 ha and is located adjacent to the Windermere Bay section of the River Derwent, south of the Cadbury factory service road.

Gallagher Jeffs have engaged North Barker Ecosystem Services (NBES) to undertake a natural values assessment (NVA) of the project area, and to make recommendations to minimise impacts to threatened natural values, particularly regarding limiting the likelihood of significant impacts to Matters of National Environmental Significance (MNES) protected under the *Commonwealth Environmental Protection and Biodiversity Conservation Act* 1999 (EPBCA) or matters protected under the Tasmanian *Threatened Species Protection Act 1995* (TSPA) (if applicable).

1.2. PROJECT AREA

The project area includes a narrow strip of dry native woodland along the water's edge, as well as an open cleared area lined by mature radiata pine (*Pinus radiata*), with scattered native and ornamental tree species. The site is located within the Hobart municipality and forms part of the Southeast Bioregion of Tasmania. Elevation across the site ranges from approximately 1 to 20 m above sea level. The underlying geology is primarily Cenozoic basalt. The majority of the project area falls within the General Industrial Zone (Zone 19), with a narrow strip along the shoreline zoned as Environmental Management (Zone 23).

1.3. METHODS

This assessment was undertaken in accordance with the 'Guidelines for Natural Values Surveys – Terrestrial Development Proposals[1].

The following sources were used for biological records for the region:

- TASVEG version 4.0 digital layer[2]
- Natural Values Atlas - all threatened species records within 500 m and 5 km of the project area and threatened fauna considered possible to occur in suitable habitat[3]
- Various thematic layers from LISTmap

1.3.1. Flora

The survey of plant species composition consisted of a meandering area search[4], with the level of survey effort proportional to the local values and the likelihood of the habitat supporting conservation significant species. Vegetation was classified according to TASVEG 4.0 units[5].

Vascular plant species lists were taken and classified according to the latest census of Tasmanian vascular plants[6]. Consideration was given to the potential for species to occur that are listed under the Tasmanian *Threatened Species Protection Act 1995* (TSPA), or the Commonwealth *Environment Protection Biodiversity Conservation Act 2000* (EPBCA). Species listed under the Tasmanian *Biosecurity Act 2019* (BA) were also noted.

[1] Department of Primary Industries, Parks, Water, and Environment (2024)
[2] Kitchener and Harris (2013)
[3] Department of Natural Resources and Environment (2025)
[4] Goff *et al.* (1982)
[5] Department of Primary Industries, Parks, Water, and Environment (2020)
[6] de Salas and Baker (2024)

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1.3.2. Fauna

The project area was surveyed for the potential presence of threatened fauna, suitable habitat, and indicative signs such as scats, tracks, and nests. These assessments were conducted concurrently with the botanical survey.

1.4. LIMITATIONS

Due to seasonal variations in detectability and identification, there may be some species present that have been overlooked. To compensate for these limitations to some degree, data from the present survey are supplemented with data from the Tasmanian Natural Values Atlas[7]. From these sources, all threatened species known to occur in the local area (5 km) are considered in terms of habitat suitability on site.

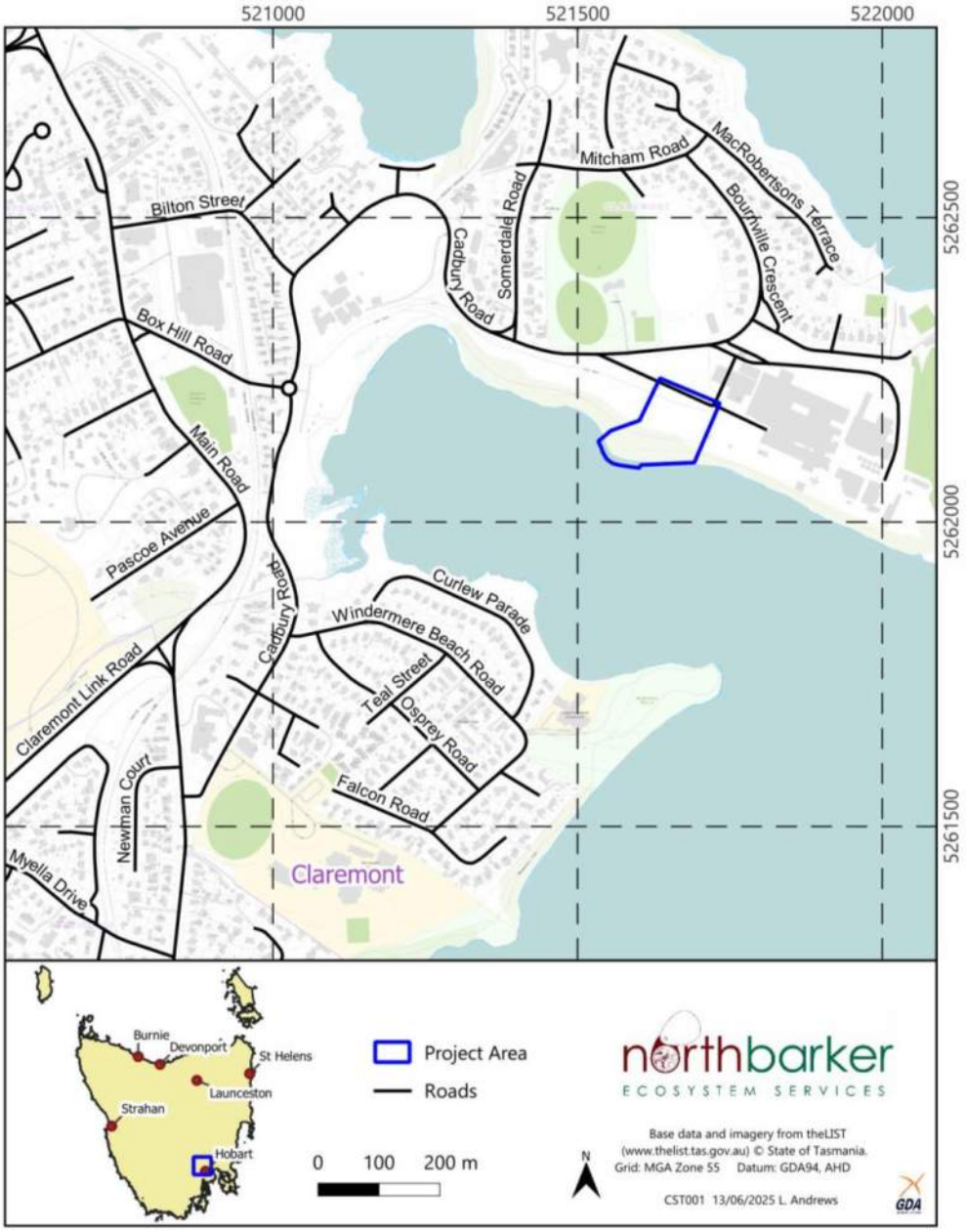


Figure 1: Location of project area

[7] Department of Natural Resources and Environment Tasmania (2025)

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2. BIOLOGICAL VALUES

2.1. VEGETATION COMMUNITIES

All native vegetation within the project area is consistent with the TASVEG community *Allocasuarina verticillata* forest (NAV) (Figure 2), which covers approximately 0.63 hectares (ha) of the site. The remaining open modified area of 0.7 ha is classified as urban areas (FUR) (Figure 2).

2.1.1. *Allocasuarina verticillata* forest (NAV)

This vegetation community occurs as a narrow strip along the shoreline in the southern half of the project area (Figure 2, Plate 1-2). It is dominated by *Allocasuarina verticillata*, with *Dodonaea viscosa* and *Bursaria spinosa* commonly present in the understorey. The ground layer is generally sparse but supports a mix of grasses and sedges, including *Poa rodwayi*, *Lepidosperma laterale*, and *Lomandra longifolia*. The vegetation on the western side is largely in good condition. In contrast, a central section of the community is more open and weedy (Plate 3). Along the eastern side, edge effects are evident, including encroachment by *Pinus radiata* and significant infestations of the declared weed blackberry (*Rubus fruticosus* agg.). A small number of eucalypt trees are also present on the eastern side.

2.1.2. Urban areas (FUR)

The northern half of the project area is best described as TASVEG unit urban areas (FUR), as it retains little native vegetation (Figure 2, Plate 4-5). The canopy is dominated by *Pinus radiata*, including a mature row of trees lining the Cadbury service road, estimated to be over 80 years old. Scattered native eucalypts are present, including two *Eucalyptus ovata* trees. A number of ornamental species are also present, such as *E. sideroxylon* and *Corymbia ficifolia*. Several ornamental plantings of *Agapanthus praecox* subsp. *orientalis*, now considered an environmental weed. The ground layer is dominated by introduced herbs and grasses, including *Arctotheca calendula*, *Stellaria media*, *Trifolium subterraneum*, and *Cynodon dactylon*, with scattered *Dactylis glomerata*.

This modified land unit is not listed under any state or federal environmental legislation.

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Plate 1: *Allocasuarina verticillata* forest (NAV) in better condition on the western section of the project area



Plate 2: *Allocasuarina verticillata* forest (NAV) meets Windemere Bay

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Plate 3: Disturbed patch of vegetation with high weed cover in the centre of *Allocasuarina verticillata* forest (NAV)



Plate 4: Large *Pinus radiata* within urban areas (FUR) lining the northern section of the project area



Plate 5: Open Urban areas (FUR) found in the northern section of the project area

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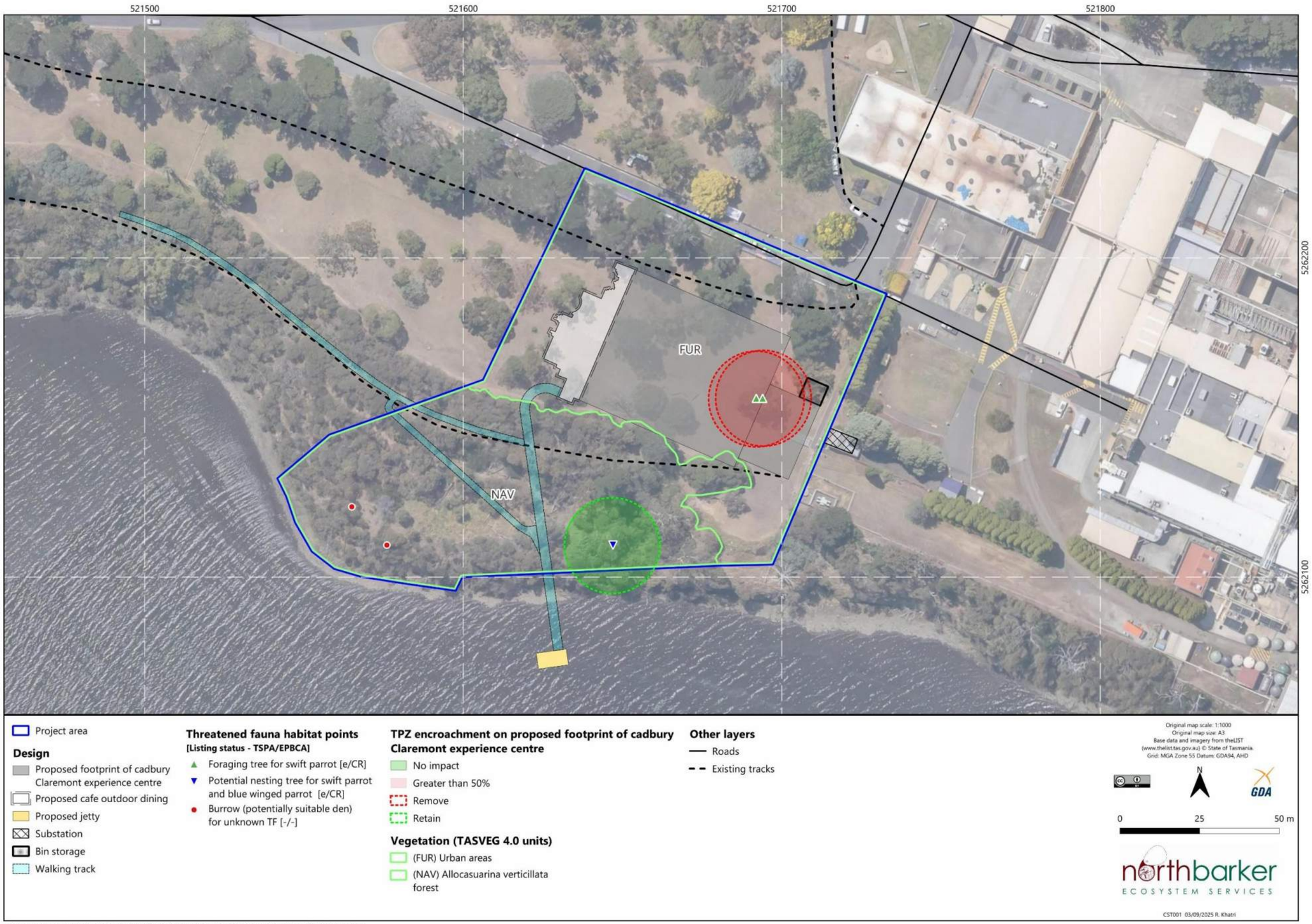


Figure 2: Location of TASVEG vegetation units and significant trees

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2.2. CONSERVATION SIGNIFICANT FLORA

Sixty-six vascular plant species were recorded within the project area during the survey, including twenty-eight non-native species. None of the flora recorded within the project area are listed as threatened under state (TSPA) or federal (EPBCA) legislation.

Forty threatened species have been recorded within 5 km of the project area, and 3 within 500 m. The likelihood of occurrence for each of these species is evaluated in Appendix B. A full list of plant species recorded during the current survey is provided in Appendix A.

2.2.1. *Vittadinia gracilis* (woolly new-holland daisy, TSPA rare)

In Tasmania, *Vittadinia gracilis* occurs in dry sites on dolerite and basalt, primarily within dry sclerophyll forests around Hobart, the Midlands, and into the north-east. One record exists close by the project area, approximately 400 m from the site, across Windermere Bay, in an open, cleared grassy area. And an additional 36 records occur within 5 km of the site. Although the project area is modified and supports limited native grass and herb cover, there remains a possibility that this species is present. However, surveys were conducted outside its peak flowering period, limiting detectability.

2.2.2. *Vittadinia muelleri* (narrowleaf new-holland-daisy TSPA rare)

This species typically occurs on the driest and most fertile soils in the Hobart region, extending into the Midlands. It is well recorded in the area, with 42 records nearby, including one in the same cleared site across Windermere Bay as *V. gracilis*, approximately 400 m from the project area. A further 330 records are documented within 5 km. Although native ground cover is sparse in the project area, the high number of nearby records suggests the species may be present. As with *V. gracilis*, surveys were undertaken outside the flowering period, limiting the likelihood of detection.

2.3. CONSERVATION SIGNIFICANT FAUNA

No threatened fauna species, or signs of their presence (e.g. tracks, scats), were recorded during the survey. Overall, the project area has the potential to provide habitat for 6 threatened species. These species are discussed individually below, with comments on their potential to utilise the project area for foraging and/or breeding.

An additional 10 threatened fauna species have been recorded within 5 km of the project area, but they are considered highly unlikely to utilise habitat within the project area[8]. Furthermore, the project area falls within the range boundaries of an additional 4 species; however, these species are also considered highly unlikely to use the project area with any regularity, if at all[9]. All of these additional species are discussed in Appendix C. Strictly coastal and marine species (e.g. fairy tern) have not been included in the discussion due to the entirely unsuitable nature of the project area for these species.

2.3.1. Blue-winged parrot (*Neophema chrysostoma*, EPBCA vulnerable):

There are nine records of this species within a 5 km radius of the project area. Blue-winged parrots utilise tree hollows for breeding and occupies a broad range of habitats, including grasslands, grassy woodlands, wetlands, and eucalyptus forests and woodlands. The open FUM area may be utilised by this species for foraging. The introduced herb capeweed (*Arctotheca calendula*), which is known to be consumed by this species, was observed alongside a mix of native and introduced grass species. One potential nesting tree was recorded in the southern half of the project area (Plate 6 - 7, Figure 2). Four

[8] Department of Natural Resources and Environment (2025)
[9] Department of Natural Resources and Environment (2025)

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hollows of a size suitable for parrot nesting were identified, with additional hollows likely present but not visible.

2.3.2. Eastern barred bandicoot (*Perameles gunnii*, TSPA vulnerable)

There are 33 records of the species within 5 km of the project area. The eastern barred bandicoot is most often found in relatively open areas such as woodlands and open grassy sites, where it forages. Its native habitat is grassland and grassy woodland dominated by tussocks, reeds and grasses. It requires thicker ground cover for nesting and shelter. This species favours a mosaic of open grassy areas for foraging with thick vegetation cover for shelter and nesting. Although the site does not provide optimal habitat, it is possible that the species may utilise vegetation within the project area, as the understorey includes some patches of grass sedge with clumps of *Poa*, *Lomandra*, and *Lepidosperma* that could offer shelter.

2.3.3. Swift parrot (*Lathamus discolor,* TSPA endangered, EPBCA critically endangered)

The project area is situated within the Hobart Swift Parrot Important Breeding Area, with 53 swift parrot observations recorded within a 5 km radius of the project area and one within 500 m. During the breeding season in Tasmania, nectar from Tasmanian blue gum (*Eucalyptus globulus*) and black gum (*E. ovata*) flowers serve as the primary food source for this species. Two mature *E. ovata* are located within the project area, and it is possible these may be utilised as a foraging resource (Plate 8, Figure 2). One potential nesting tree was recorded within the southern half of the project area (Plate 6, 7, Figure 2. Four hollows of a size suitable for parrot nesting were observed with likely more out of view.

2.3.4. Tasmanian wedge-tailed eagle (*Aquila audax subsp. fleayi*, TSPA and EPBCA endangered)

There are 55 records of this species within 5 km of the project area, though none within 500 m. As this species forages across a broad range of habitat types, it is quite possible it utilises the project area for foraging on occasion. The species nests in a variety of old growth native forests and is dependent on forested areas for nesting. No eagle nests are known within 500 m or within 1 km line of sight of the project area (distances typically used in guidelines for reducing disturbance from nearby operations and works[18]). The nearest known nest is located approximately 7 km to the northeast. No trees of a size suitable for nesting were recorded within the project area.

The nearest suitable habitat modelled by the Forest Practices Authority lies 2.3 kms west and 2.4 kms east. No nests were observed during ground-based surveys of surrounding trees, and it is not considered likely any unknown nests lie within 1 km of the project area.

2.3.5. White-bellied sea-eagle (*Haliaeetus leucogaster*, TSPA vulnerable, EPBCA marine)

This species is known to occur in the area, with 1 record within 5 km of the project area and 1 within 500 m. It is most likely to utilise the nearby bay and Derwent for foraging. Given the availability of higher-quality foraging habitat in close proximity to the site, the species is considered unlikely to utilise the project area for foraging. This species is restricted to nesting within 5 km of coastlines, major estuaries and inland lakes. They typically build nests in large eucalypt trees, much like the Tasmanian wedge-tailed eagle (*Aquila audax fleayi*), although their specific nesting requirements are not as strict, such that they are known to nest in relatively small and exposed coastal trees. No nests are known to occur within 1 km, the nearest known nest is approximately 6.8 km to the southeast. As noted in relation to the wedge-tailed eagle, the eagle habitat model identifies areas of potentially suitable nesting habitat

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mapped 2.3 kms west and 2.4 kms east. No nests were observed during ground-based surveys of surrounding trees, and it is not considered likely any unknown nests lie within 1 km.

2.3.6. White-throated needletail (*Hirundapus caudacutus*, EPBCA vulnerable)

The are two records within 5 km of the project area. This migratory species breeds in the northern hemisphere and spends its non-breeding season in Australia. It is almost exclusively aerial, occurring over most types of habitats with a preference for wooded areas, open forests, heathland and rainforests. It is quite possible the species forages over the project area from time to time.



Plate 6: Two larger hollows observed in a mature *Eucalyptus viminalis* tree located in the south-eastern section of the project area



Plate 7: Two smaller hollows observed in a mature *Eucalyptus viminalis* tree located in the south-eastern section of the project area

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Plate 8: Two mature *Eucalyptus ovata* trees providing foraging habitat for the swift parrot (*Lathamus discolor*).

2.4. INTRODUCED PLANTS AND PATHOGENS

A total of twenty-eight non-native plant species were recorded across the project area during the survey. Of these, four are listed as declared weeds under the *Tasmanian Biosecurity Act 2019*. These include blackberry (*Rubus fruticosus* aggregate), boneseed (*Chrysanthemoides monilifera*), fennel (*Foeniculum vulgare*) and slender thistle (*Carduus pycnocephalus*). The distribution of these weed species is illustrated in Figure 3.

All of declared weeds onsite are classified as Zone B declared weeds within the Hobart municipal area. Under this zoning, the primary management objective is to prevent the spread of these species to other municipalities and landholdings, while containing their populations within the site. This is particularly relevant during construction activities, where soil disturbance and machinery movement can exacerbate weed spread if not appropriately managed.

Radiata pine (*Pinus radiata*), while not a declared weed under the *Biosecurity Act 2019*, is recognised as an environmental weed in Tasmania. It was recorded within areas of native vegetation on-site, where it poses a threat to native vegetation.

Weed management recommendations are provided in Section 3.4.

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Plate 9: Blackberry (*Rubus fruticosus aggregate*) patch found in the eastern half of NAV vegetation



Plate 10: Boneseed (*Chrysanthemoides monilifera*) found scattered throughout the project area

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Plate 11: Patch of fennel (*Foeniculum vulgare*) observed in a disturbed area within the central section of the NAV vegetation



Plate 12: : Patch of slender thistle (*Carduus tenuiflorus*) observed in a disturbed area within the central NAV vegetation

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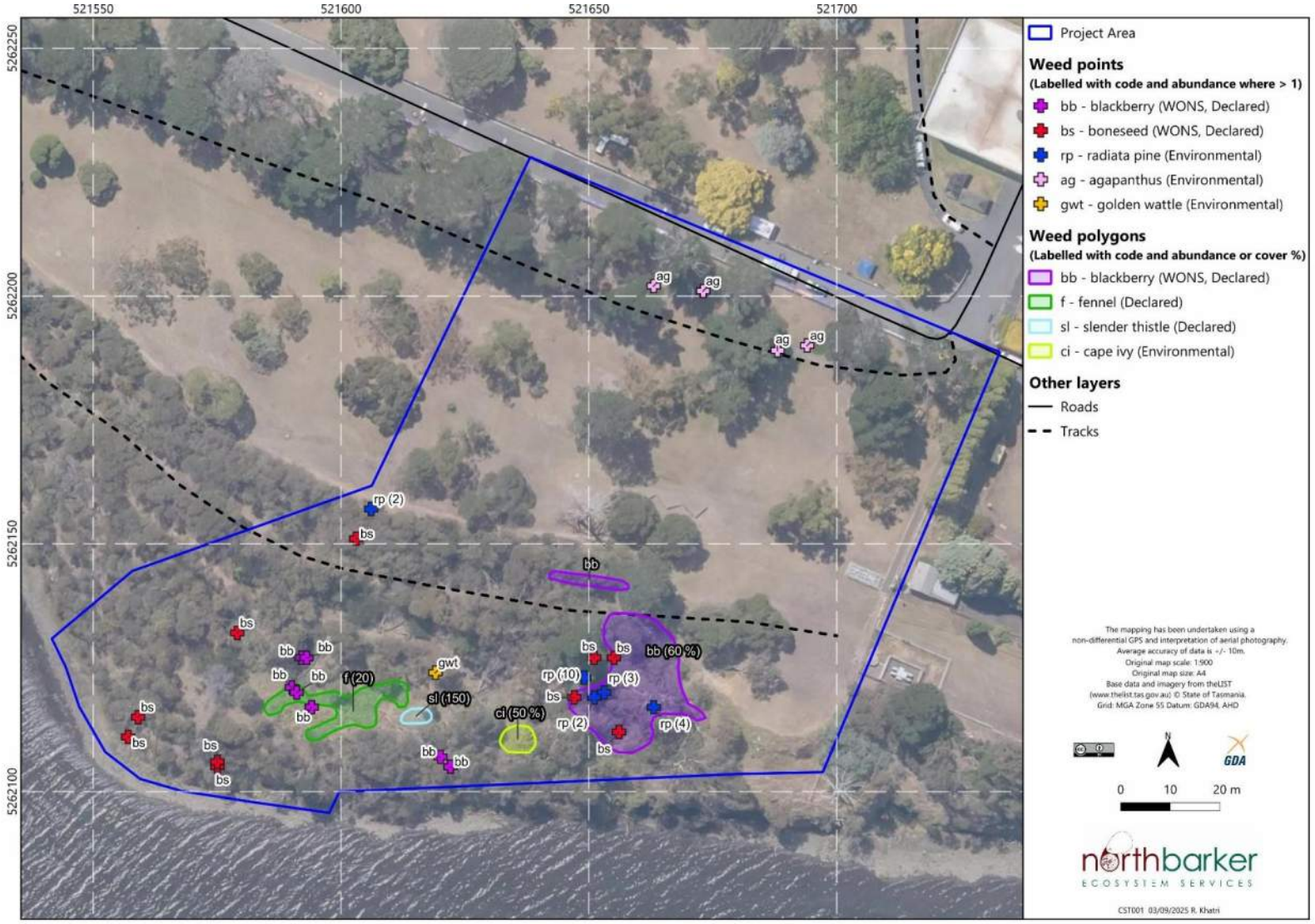


Figure 3: Map showing the distribution of weed species throughout the project area

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2.5. GEOCONSERVATION SITES

There are no known geoconservation sites within the project area. The nearest geoconservation site is the Old Beach Fossil Locality, located approximately 2.2 km to the northeast. This site is recognised as being of national geological significance, a location where several significant fossils were obtained.

3. ASSESSMENT OF IMPACT AND MITIGATION

3.1. VEGETATION COMMUNITIES

A total 0.63 ha of *Allocasuarina verticillata* forest (NAV) is present within the project area. Although this native vegetation is not listed as a threatened community under the *Nature Conservation Act 2002*, it is recommended that impacts on this vegetation type be minimised wherever possible, as it provides important environmental and social benefits, including foreshore stabilisation, wind buffering, and habitat value.

3.2. CONSERVATION SIGNIFICANT FLORA

No threatened flora species were recorded within the project area during the survey. However, *Vittadinia gracilis* (woolly new-holland daisy) and *Vittadinia muelleri* (narrowleaf new-holland daisy), both listed as rare under the TSPA, are known from multiple nearby records, with many approximately 400 m from the site on the opposite side of Windermere Bay.

Although the project area is highly modified and supports limited native grass and herb cover, the proximity of these records means there remains a possibility that one or both species are present. Surveys were undertaken outside the primary flowering period (November to May), reducing detectability. To confirm absence and avoid unintentional impact, targeted surveys during the flowering period are recommended.

If either species is confirmed on site, appropriate mitigation would include avoiding disturbance to identified individuals and implementing weed and hygiene controls to protect habitat quality. Given current site conditions, the risk of significant impact is considered low, provided recommended follow-up surveys and management measures are undertaken.

3.3. CONSERVATION SIGNIFICANT FAUNA

3.3.1. Blue-winged parrot (*Neophema chrysostoma*, EPBCA vulnerable)

There is ample foraging habitat of similar quality within the surrounding landscape, including several parklands, golf course, and sporting oval. As such, the loss of open FUM vegetation is expected to have a negligible impact on this species. However, the potential nesting tree should be avoided. Avoidance should be achievable, as it is understood that the proposed development in this part of the project area primarily involves the construction of a walkway to the shoreline. If the proposed works are expected to encroach upon more than 10% of the associated Tree Protection Zone (TPZ), it is recommended that a qualified arborist assess whether retention of the tree is viable.

3.3.2. Eastern barred bandicoot (*Perameles gunnii*, TSPA vulnerable)

Although the native vegetation on-site is not considered optimal for this species, it is recommended that any impacts be prioritised within areas that are already cleared, including the open, weedy section running through the centre of the NAV vegetation. This will help minimise potential impacts on the species.

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3.3.3. Tasmanian wedge-tailed eagle (*Aquila audax subsp. fleayi*, TSPA and EPBCA endangered) and White-bellied sea-eagle (*Haliaeetus leucogaster*, TSPA vulnerable, EPBCA marine)

There are no nests or nesting habitat in the project area and the loss of potential foraging habitat is negligible. No mitigation or management measures are recommended for eagles.

3.3.4. Swift parrot (*Lathamus discolor,* TSPA endangered, EPBCA critically endangered)

Two foraging trees and one potential nesting tree are present within the project area. It is recommended that the project footprint be designed to avoid all three trees, with priority given to the avoidance of the potential nesting tree. Although the loss of the two foraging trees is not anticipated to have a significant impact on this species, should their removal be necessary, it is recommended that additional swift parrot foraging trees be planted as an offset during the development works. Suitable replacement species include *Eucalyptus ovata* and *E. globulus*. The potential nesting tree is considered the highest priority for retention. Avoidance should be feasible, given that the proposed development in this section of the project area primarily involves the construction of a walkway to the shoreline. If the impact is expected to encroach upon > 10% of the Tree Protection Zone (TPZ), it is recommended that a qualified arborist assess whether the tree can be retained.

3.3.5. White-throated needletail (*Hirundapus caudacutus*, EPBCA vulnerable)

This is primarily and aerial species and the construction of the project will have no impact on the species, no mitigation or management measures are recommended.

3.3.6. General avifauna collision impacts

The proposed development has been considered in terms of its overall potential to increase the risk of bird collisions in the local area, with a particular emphasis on the projects potential to negatively impact upon threatened species in this regard.

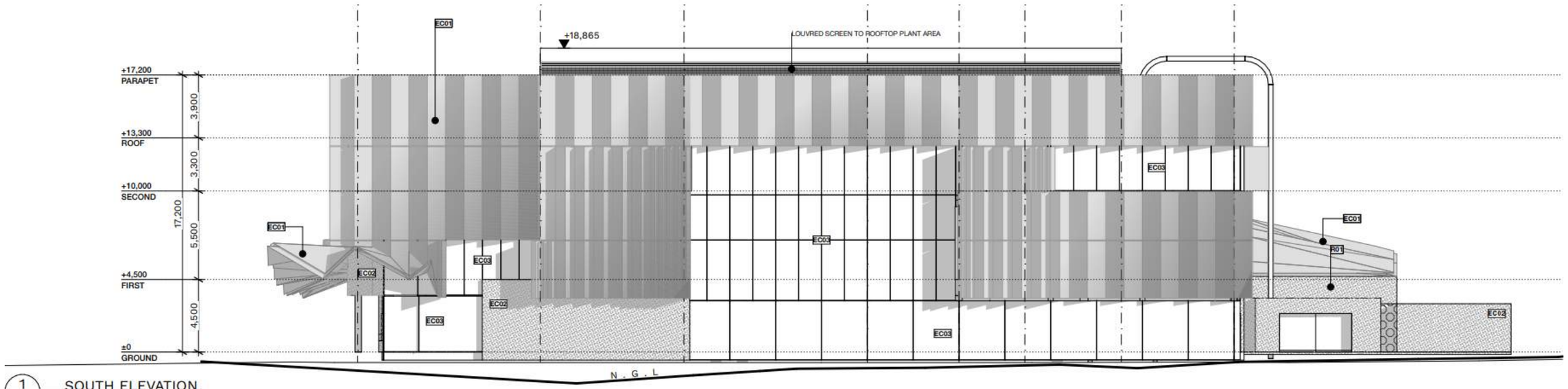
Several terrestrial avifauna have been recorded within 5 km of the project area including the grey goshawk (*Accipiter novaehollandiae*), wedge-tailed eagle (*Aquila audax fleayi*), white-bellied sea eagle (*Haliaeetus leucogaster*), swift parrot (*Lathamus discolor*), blue-winged parrot (*Neophema chrysostoma*) and masked owl (*Tyto novaehollandiae*). Whilst no optimal breeding habitat for these species will be impacted by the proposed development, there is potential for these species to be observed infrequently within the project area whilst foraging or dispersing. However, the parameters and layout of proposed structures (aligned closely to the heights of existing vegetation and buildings in the area - Plate 13) and the low likelihood of the occurrence of these species within the project area on any given day, means that the likelihood of increasing the collision risk to any of these species as a result of the proposed new structures in very low.

Additional threatened avifauna known from within 5 km of the project area include riverine/wetland associated species such as the Australasian bittern (*Botaurus poiciloptilus*), Lathams snipe (*Gallinago hardwickii*) and the great crested grebe (*Podiceps cristatus*). No suitable habitats for these species occur in proximity of the project area, and collision with buildings is not a recognised threat to these species[10]. As such, no increased collision risk is anticipated for any riverine/wetland avifauna.

Additional threatened marine/coastal avifauna occur within 5 km of the project area including the white-fronted tern (*Sterna striata*), little tern (*Sternula albifrons* subsp. *sinensis*) and hooded plover (*Thinornis cucullatus*). No increased risk to any of these species is anticipated (no suitable habitat).

[10] Respective species profiles obtained from the Threatened Species Link (TSPA) and/or online SPRAT Profiles (EPBCA).

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1 A110 SOUTH ELEVATION 1:200







Plate 13. Building plan elevations and mock renderings of proposed structure

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3.4. INTRODUCED PLANTS AND PATHOGENS

Four declared weed species were recorded during the survey: blackberry (*Rubus fruticosus* aggregate), boneseed (*Chrysanthemoides monilifera*), fennel (*Foeniculum vulgare*) and slender thistle (*Carduus pycnocephalus*). All of which are classified as Zone B weeds in the Hobart municipality, with management focused on containing their spread within the site and preventing movement beyond it.

In addition to declared weeds, control measures should also include environmental weeds such as radiata pine. A staged removal program should be considered for both mature trees and seedlings, particularly in areas of remnant native vegetation and within the foreshore zone. Material from pine removal should not be mulched or reused on-site due to the risk of seed spread.

The following weed and hygiene impact measures are recommended:

1. A weed management plan should be developed to cover all relevant aspects of the control and management of declared weeds, including but not limited to:
    - An overarching set of objectives and the context in which they are to be achieved.
    - Strategies for ongoing monitoring and control of weeds within the project area and adjacent areas of native vegetation.
    - Strategies for managing weeds.
    - Identification of appropriate herbicides for control and their recommended application methods.
    - An auditing process to ensure compliance with the weed management plan.
2. A hygiene plan should be developed as part of the Weed Management Plan to ensure:
    - No introduction of new declared weeds or significant environmental weed species into the area.
    - No translocation of weeds within the project area or the import of weeds from outside the area.
    - Vehicle, machinery, and equipment hygiene protocols are followed.
    - Washdown procedures are implemented when transitioning between clean and contaminated areas.
    - Location and management of washdown areas and facilities, including effluent management.
    - Logbooks maintained detailing adherence to hygiene protocols for all contractors.
    - Material hygiene (e.g., soils, gravel, plant material) ensures that no materials contaminated with weed propagules are imported or reused.
    - Periodic inspections for weeds are conducted, and measures are in place to respond to any identified infestations.

Best practice procedures for weed and hygiene management should be based upon the following state-recognised guidelines:

- *Keeping it clean - A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens* (Allen and Gartenstein, 2010)
- *Weed and Disease Planning and Hygiene Guidelines - Preventing the spread of weeds and diseases in Tasmania* (DPIPWE, Stewart and Askey-Doran, 2015)
- *Wetlands and Waterways Works Manual* (DPIPWE, 2003)

3.5. GEOCONSERVATION SITES

No known geoconservation sites will be impacted by the project.

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4. LEGISLATIVE IMPLICATIONS

4.1. COMMONWEALTH *ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999*

The EPBCA is structured for self-assessment, with guidelines and criteria available to assist any person who proposes to take an action to decide whether they should submit a referral to the national Department of Climate Change Energy Environment and Water (DCCEEW) a decision by the Environment Minister (the minister) on whether assessment and approval is required under the Act.

Referral under the EPBC Act will be necessary if, as the Act states:

> *'An action has, will have, or is likely to have a significant impact on an endangered or vulnerable species if it does, will, or is likely to (amongst other things):*
>
> - *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.'*

Potential habitat for EPBCA-listed fauna has been identified in the project area, particularly for the swift parrot, blue-winged parrot and eastern barred bandicoot.

It is recommended impact to the potential nesting tree for swift and blue-winged parrots be avoided.

The eastern barred bandicoot is unlikely to be significantly affected, as the disturbance to native habitat is minor and suitable habitat is abundant in the surrounding landscape.

Given the relatively small scale of the impact, and the broad availability of habitat in the surrounding landscape, it is not expected that there will be a significant impact to any of these species as defined in the Act; however, this will need to be further considered once the design footprint is finalised.

4.2. TASMANIAN *THREATENED SPECIES PROTECTION ACT 1995*

Under the TSPA, a person cannot knowingly without a permit 'take' a listed species. The definition of 'take' encompassing actions that kill, injure, catch, damage, destroy and/or collect threatened species or vegetation elements that support threatened species, *e.g.,* nests and dens.

Disturbance to either threatened flora or fauna species within the meaning of the word 'take' under the Act will trigger the requirement for a permit under this Act.

No threatened flora species were recorded within the project area, and the risk of impacting listed flora is considered low. However, *Vittadinia gracilis* and *V. muelleri* are known from multiple records nearby, and surveys were conducted outside their peak flowering period. As such, their presence cannot be ruled out, and targeted surveys during the flowering season are recommended to confirm absence and avoid any unintentional impact.

A hollow-bearing tree that may provide nesting habitat for threatened bird species (e.g. blue-winged parrot or swift parrot) is also present within the site. While avoidance is considered achievable, any impact to this tree, particularly if it is found to be in use may trigger the need for a permit under the TSPA. If active burrows or dens are discovered during pre-clearance surveys, a permit under the Act will be required. Permits may also require additional surveys or management measures.

4.3. TASMANIAN *NATURE CONSERVATION ACT 2002*

No threatened vegetation communities are located within the project area, the project will therefore not be assessed under LUPAA in relation to threatened and/or priority vegetation.

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4.4. TASMANIAN *BIOSECURITY ACT 2019*

Four declared weed species were recorded during the survey: blackberry (*Rubus fruticosus* aggregate), boneseed (*Chrysanthemoides monilifera*), fennel (*Foeniculum vulgare*) and slender thistle (*Carduus pycnocephalus*).

In the Hobart municipality, these are classified as Zone B declared, therefore containment is the aim of the management plan. Appropriate hygiene should continue to be applied to avoid the introduction of other species listed under this Act or spread of declared weeds to areas without infestations. The proposed weed and hygiene measures included in this report should be followed to ensure compliance.

4.5. TASMANIAN *LAND USE PLANNING AND APPROVALS ACT 1993*

In consideration of the requirements of LUPAA, each municipal area incorporates development standards codes under the appropriate planning scheme. The proposed development is entirely within the Hobart Council Area and is subject to the Tasmanian Planning Scheme.

4.6. TASMANIAN PLANNING SCHEME

4.6.1. Zoning

The majority of the project area lies within the General Industrial Zone (Zone 19), however, a narrow strip along the shoreline falls within the Environmental Management Zone (Zone 23). Two code overlays that relate to natural values lie within this Environmental Management Zone. These are addressed below.

4.6.2. Code Overlays

The project area is subject to a priority vegetation overlay and waterways and coastal protection area overlay (Figure 4). Both of these overlays are addressed under the Natural Assets Code.

Natural Assets Code (C7.0)

The purpose of the Natural Assets Code is to[11]:

1. Minimise impacts on water quality, natural assets including native riparian vegetation, river condition and the natural ecological function of watercourses, wetlands, and lakes.
2. To minimise impacts on coastal and foreshore assets, native littoral vegetation, natural coastal processes, and the natural ecological function of the coast.
3. To protect vulnerable coastal areas to enable natural processes to continue to occur, including the landward transgression of sand dunes, wetlands, saltmarshes, and other sensitive coastal habitats due to sea-level rise.
4. To minimise impacts on identified priority vegetation.
5. To manage impacts on threatened fauna species by minimising clearance of significant habitat.

Waterway and Coastal Protection Area and Future Coastal Refugia Area (C7.6.1)

The Waterway and Coastal Protection Area provision applies to the waterfront in the south of the project area (Figure 4). The Waterway and Coastal Protection Area refers to land that is[12]:

(a) shown on an overlay map in the relevant Local Provisions Schedule as within a waterway and coastal protection area; or

(b) within the relevant distance from a watercourse, wetland, lake or the coast but does not include a piped watercourse or piped drainage line.

[11] Code Purpose C7.1; Tasmanian Planning Scheme
[12] Definition of Terms Table C7.3.1; Tasmanian Planning Scheme 2020

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The Development Standards for buildings and works within a Waterway and Coastal Protection Area are addressed in Table 1 below.

Table 1: Buildings and works within a waterway and coastal protection area or a future coastal refugia area[13]

Objective		
That buildings and works within a waterway and coastal protection area or future coastal refugia area will not have an unnecessary or unacceptable impact on natural assets.		
Acceptable Solutions		
A1 Buildings and works within a waterway and coastal protection area must:		
(a)	Be within a building area on a sealed plan approved under this planning scheme.	This acceptable solution cannot be met.
(b)	In relation to a Class 4 watercourse, be for a crossing or bridge not more than 5m in width.	Not applicable to this proposal.
(c)	If within the spatial extent of tidal waters, be an extension to an existing boat ramp, car park, jetty, marina, marine farming shore facility or slipway that is not more than 20% of the area of the facility existing at the effective date.	This acceptable solution cannot be met.
The proposed development will not meet the acceptable solution; thus, the performance criteria must be regarded.		
Performance Criteria		
P1.1 Buildings and works within a waterway and coastal protection area must avoid or minimise adverse impacts on natural assets, having regard to:		
(a)	Impacts caused by erosion, siltation, sedimentation, and runoff.	Any future development will likely result in an increase in run off from the creation of hard surfaces. Any potential impacts should be mitigated by implementing an erosion and sedimentation control plan before, during, and after construction.
(b)	Impacts on riparian or littoral vegetation.	Minimal vegetation clearing should occur in the waterway and coastal protection area. Erosion, siltation, sedimentation, and runoff will be addressed as per criterion (a).
(c)	maintaining natural streambank and streambed condition, where it exists.	No impacts to natural streambank or streambed are anticipated as they occur outside of the designated developable area.
(d)	Impacts on in-stream natural habitat, such as fallen logs, bank overhangs, rocks, and trailing vegetation.	No impacts to in-stream habitats are anticipated as they occur outside of the designated developable area.

[13] Development Standards for Buildings and Works table C7.6.1; Tasmania Planning Scheme 2020

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(e)	The need to avoid significantly impeding natural flow and drainage.	Any future development is not expected to impede the natural flow and drainage of waterways in the area as the designated developable area does not overlap with any of the known waterways.
(f)	The need to maintain fish passage, where known to exist.	Not applicable to this proposal.
(g)	The need to avoid land filling of wetlands.	No wetlands are anticipated to be required to be filled as they occur outside of the project area.
(h)	The need to group new facilities with existing facilities, where reasonably practical.	The project area is largely free of existing infrastructure. Access to the site area is expected to align with the existing access road.
(i)	Minimising cut and fill.	It is anticipated that any cut and fill necessary for the proposal will be minimal.
(j)	Building design that responds to the particular size, shape, contours, or slope of the land.	Unknown.
(k)	Minimising impacts on coastal processes, including sand movement and wave action.	The proposal is not expected to impact coastal processes, as the majority of the development is understood to occur outside the coastal protection area and is only likely to involve the construction of a walkway. To ensure the walkway does not affect the natural ecological function of the coast, it is recommended that an elevated structure be constructed through the waterway and coastal protection area. The walkway should be supported by individual piles or piers, rather than solid foundations or continuous walls, to allow water and any suspended sediment to flow relatively unimpeded beneath the structure.
(l)	Minimising the need for future works for the protection of natural assets, infrastructure, and property.	the design and construction should follow recommendations from the Tasmanian Coastal Works Manual to ensure long-term stability and minimal environmental impact. The protection of natural assets, infrastructure, and property is not anticipated beyond the need for routine maintenance and emergency works that may arise.
(m)	The environmental best practice guidelines in the *Wetlands and Waterways Works Manual*.	It is anticipated that all works associated with any future development will adhere to best practice guidelines set out in the Wetlands and Waterways Works Manual.
(n)	The guidelines in the *Tasmanian Coastal Works Manual*.	It is anticipated that all works associated with any future development will adhere to best practice guidelines set out in the Tasmanian Coastal Works Manual.

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The proposed design has been considered in the context of criteria (a), (b), (e), (h), (i), (m), and (n), and is expected to have minimal impacts and will therefore satisfy the performance criteria. Other criteria: (c), (d), (f), (g), (j), (k), and (l) are satisfied by the location of the designated developable area, which avoids values relevant to those criteria.		
P1.2 Buildings and works within the spatial extent of tidal waters must be for a use that relies upon a coastal location to fulfil its purpose, having regard to:		
The project area does not lie within the spatial extent of tidal waters, as such, P1.2 is not applicable to the proposal.		
It is our assessment that the any future development, if clearing within the overlay be kept to a minimum and limited to the construction of a walkway, would be capable of meeting the purpose and objectives of this aspect of the Natural Assets Code. Residual impacts can be mitigated by works being undertaken in accordance with a site-specific erosion and sedimentation plan, which regards: • *Tasmanian Coastal Works Manual: a best practice management guide for changing coastlines*[14] • *Wetlands and Waterways Works Manual*[15],		
P2.1 Buildings and works within a future coastal refugia area must allow for natural coastal processes to continue to occur and avoid or minimise adverse impacts on natural assets, having regard to:		
(a)	Allowing for the landward transgression of sand dunes and the landward colonisation of wetlands, saltmarshes and other coastal habitats from adjacent areas;	No sand dunes, wetlands, or saltmarsh habitats in proximity to works. Coastal fringe within project area characterised by a stable embankment of large rock and boulders. No landward transgression anticipated.
(b)	Avoiding the creation of barriers or drainage networks that would prevent future tidal inundation;	No barriers will be constructed that affect tidal inundation.
(c)	Allowing the coastal processes of sand deposition or erosion to continue to occur;	Natural coastal (riverine) processes for deposition and erosion area anticipated post-construction.
(d)	The need to group new facilities with existing facilities, where reasonably practical;	New construction within an area supporting existing industrial/commercial buildings.
(e)	The impacts on native vegetation;	Minimal impacts to native vegetation are anticipated, particularly in the near coastal/riverside fringe.
(f)	Minimising cut and fill;	The works will aim to minimise the amount of cut and fill
(g)	Building design that responds to the particular size, shape, contours or slope of the land;	Majority of buildings and works for the project occur outside of the coastal refugia overlay. The primary access from the riverside involves pathway construction within the overlay and will

[14] Page & Thorp (2010)
[15] Department of Primary Industries, Water and Environment (2003)

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		be undertaken in a manner that is sensitive to the local topography and land conditions.
(h)	The impacts of sea-level rise on natural coastal processes and coastal habitat;	Sea-level rise is not expected to influence the proposed development to any meaningful degree and will not exacerbate any particular impacts to coastal processes or coastal habitat.
(i)	The environmental best practice guidelines in the Wetlands and Waterways Works Manual; and	The guidelines will be followed
(j)	The guidelines in the *Tasmanian Coastal Works Manual*	The guidelines will be followed

Priority Vegetation Area (C7.6.2)

The priority vegetation area refers to a rectangular parcel of land of approximately 1,680 m^2 which intersects with the southern boundary of project area (Figure 4) and is subject to the priority vegetation overlay in the Glenorchy Local Provisions Schedule of the Tasmanian Planning Scheme.

Priority vegetation is defined as land that has native vegetation where any of the following apply (Clause 7.3.1)[16]:

(a) It forms an in integral part of a threatened native vegetation community as prescribed under Schedule 3A of the Nature Conservation Act 2002;
(b) is a threatened flora species;
(c) it forms a significant habitat for a threatened fauna species; or
(d) it has been identified as native vegetation of local importance.

Criteria (a) and (b) are not applicable in this case, as no threatened vegetation communities are present, and no threatened flora species were recorded at the time of the survey.

Criterion (c): 'Significant habitat' is defined as habitat located within the known or core range of a threatened fauna species, where it is either:

- recognised as high priority for the maintenance of breeding populations throughout the species' range; or
- considered likely to result in a long-term negative impact on breeding populations if converted to non-priority vegetation.

Performance criteria P1.1 a)-c) are not relevant to this proposal and therefore cannot be met. Performance criteria P1.1 d) is likely to be satisfied, however, as this pertains to socio-economic factors , this is beyond the remit of an ecologist to make an informed assessment on. Criterion P.1.1 e) and f) are also not applicable as the vegetation to be cleared in this area does not meet the definition of priority vegetation as specified in Clause 7.3.1.

Performance criteria P1.2 is also not applicable as there is no vegetation within the priority vegetation area that meets the definition of priority vegetation in Clause 7.3.1; thus, there is no chance of any adverse impact to priority vegetation.

An account of each of the priority vegetation area performance criteria is provided in Table 2.

[16] Definition of Terms Table C7.3.1; Tasmanian Planning Scheme 2020

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Table 2. Clearance within a priority vegetation area

Objective		
That clearance of native vegetation within a priority vegetation area: (a) Does not result in unreasonable loss of priority vegetation; (b) Is appropriately managed to adequately protect identified priority vegetation; and (c) Minimises and appropriately manages impacts from construction and development activities.		
Acceptable Solutions		
A1	Clearance of native vegetation within a priority vegetation area must be within a building area on a sealed plan approved under this planning scheme.	Development is not within a building area and therefore cannot meet this acceptable solution, therefore performance criteria P1.1 and P1.2 must be addressed.
Performance Criteria		
P1.1 Clearance of native vegetation within a priority vegetation area must be for:		
(a)	An existing use on the site, provided any clearance is contained within the minimum area necessary to be cleared to provide adequate bushfire protection, as recommended by the Tasmanian Fire Service or an accredited person.	Not applicable.
(b)	Buildings and works associated with the construction of a single dwelling or an associated outbuilding.	Not applicable.
(c)	Subdivision in the General Residential Zone or Low-Density Residential Zone.	Not applicable.
(d)	Use or development that will result in significant long term social and economic benefits and there is no feasible alternative location or design.	Likely to be satisfied.
(e)	Clearance of native vegetation where it is demonstrated that on-going pre-existing management cannot ensure the survival of the priority vegetation and there is little potential for long-term persistence.	Not applicable.
(f)	The clearance of native vegetation that is of limited scale relative to the extent of priority vegetation on the site.	Not applicable.

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P1.2 Clearance of native vegetation within a priority vegetation area must minimise adverse impacts on priority vegetation, having regard to:		
(a)	The design and location of buildings and works and any constraints such as topography or land hazards.	Not applicable.
(b)	Any particular requirements for the buildings and works.	Not applicable.
(c)	Minimising impacts resulting from bushfire hazard management measures through siting and fire-resistant design of habitable buildings.	Not applicable.
(d)	Any mitigation measures implemented to minimise the residual impacts on priority vegetation.	Not applicable.
(e)	Any on-site biodiversity offsets.	Not applicable.
(f)	Any existing cleared areas on the site.	Not applicable.

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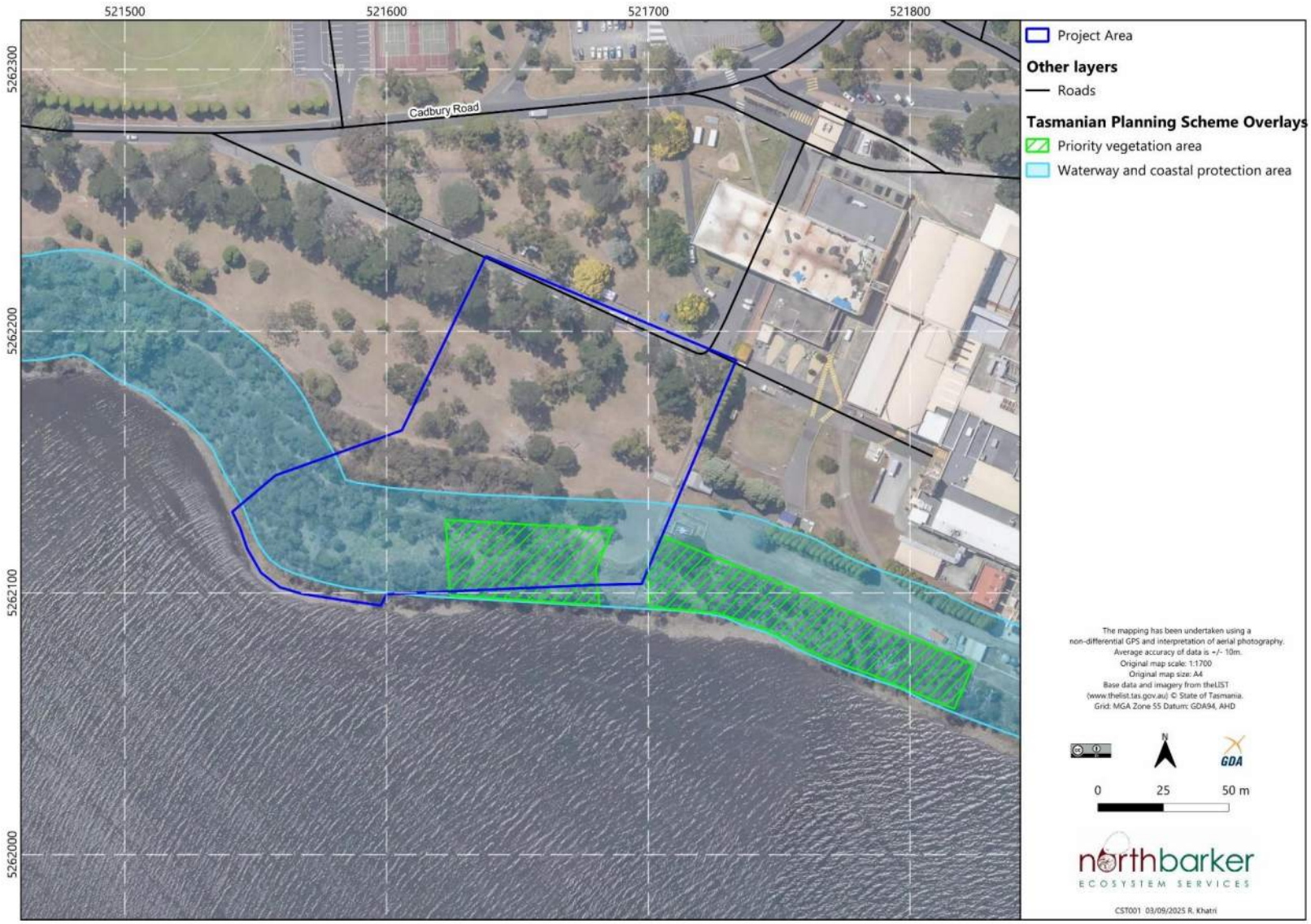


Figure 4: Code overlays relevant to the project area

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APPENDIX A – VASCULAR FLORA SPECIES LIST

Status codes:

ORIGIN	NATIONAL SCHEDULE	STATE SCHEDULE
i - introduced	EPBC Act 1999	TSP Act 1995
d - declared weed WM Act	CR - critically endangered	e - endangered
en - endemic to Tasmania	EN - endangered	v - vulnerable
t - within Australia, occurs only in Tas.	VU - vulnerable	r - rare

Sites:

1	Allocasuarina verticillata forest (NAV) - E521602, N5262118	30/05/2025	Sally Anthony
2	Urban areas (FUR) - E521694, N5262155	30/05/2025	Sally Anthony

Site	Name	Common name	Status
	DICOTYLEDONAE		
	AIZOACEAE		
2	*Carpobrotus rossii*	native pigface	
	APIACEAE		
1	*Foeniculum vulgare*	fennel	d
	ASTERACEAE		
2	*Arctotheca calendula*	capeweed	i
1	*Carduus pycnocephalus*	slender thistle	d
1 2	*Chrysanthemoides monilifera subsp. monilifera*	boneseed	d
1	*Cirsium vulgare*	spear thistle	i
1	*Delairea odorata*	cape ivy	i
1	*Senecio minimus*	shrubby fireweed	
2	*Sonchus oleraceus*	common sowthistle	i
	BORAGINACEAE		
1	*Hackelia suaveolens*	sweet hounds-tongue	
	BRASSICACEAE		
1	*Barbarea intermedia*	garden wintercress	i
1	*Hirschfeldia incana*	hoary mustard	i
1	*Lepidium africanum*	common peppercress	i
	CAPRIFOLIACEAE		
2	*Viburnum tinus*	Laurustinus	i#
	CARYOPHYLLACEAE		
1	*Stellaria flaccida*	forest starwort	
1 2	*Stellaria media*	garden chickweed	i
	CASUARINACEAE		
1	*Allocasuarina verticillata*	drooping sheoak	
	CHENOPODIACEAE		
1 2	*Einadia nutans subsp. nutans*	climbing saltbush	
	CLUSIACEAE		
1	*Hypericum gramineum*	small st johns-wort	

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	FABACEAE		
1 2	*Acacia mearnsii*	black wattle	
2	*Acacia melanoxylon*	blackwood	
1	*Acacia pycnantha*	golden wattle	i
1	*Glycine clandestina*	twining glycine	
2	*Trifolium subterraneum*	subterranean clover	i
1	*Vicia sativa subsp. sativa*	common vetch	i
	FUMARIACEAE		
1	*Fumaria muralis subsp. muralis*	wall fumitory	i
	GERANIACEAE		
2	*Erodium moschatum*	musky heronsbill	i
1	*Geranium potentilloides var.*	mountain cranesbill	
	LINACEAE		
1	*Linum sp.*	native flax	
	MYRTACEAE		
2	*Corymbia ficifolia*	red flowering gum	i
2	*Eucalyptus ovata var. ovata*	black gum	
2	*Eucalyptus sideroxylon*	red ironbark	i
1	*Eucalyptus sp.*	gum	
1	*Eucalyptus viminalis subsp. viminalis*	white gum	
	OXALIDACEAE		
1	*Oxalis perennans*	grassland woodsorrel	
	PITTOSPORACEAE		
1	*Bursaria spinosa subsp. spinosa*	prickly box	
	PLANTAGINACEAE		
1 2	*Plantago coronopus*	buckshorn plantain	i
1 2	*Plantago lanceolata*	ribwort plantain	i
	POLYGONACEAE		
1 2	*Acetosella vulgaris*	sheep sorrel	i
	RESEDACEAE		
1	*Reseda luteola*	weld	i
	ROSACEAE		
1	*Acaena echinata*	spiny sheeps burr	
1	*Rosa rubiginosa*	sweet briar	i
1	*Rubus fruticosus*	blackberry	d
	RUBIACEAE		
1 2	*Galium australe*	tangled bedstraw	
	SANTALACEAE		
1	*Exocarpos cupressiformis*	common native-cherry	
	SAPINDACEAE		
1	*Dodonaea viscosa subsp. spatulata*	broadleaf hopbush	

GYMNOSPERMAE

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	PINACEAE		
1 2	*Pinus radiata*	radiata pine	i
	MONOCOTYLEDONAE		
	AGAPANTHACEAE		
2	*Agapanthus praecox subsp. orientalis*	agapanthus	i
	ASPARAGACEAE		
1	*Lomandra longifolia*	sagg	
	ASPHODELACEAE		
1	*Bulbine sp*	bulbine-lily	
	CYPERACEAE		
1	*Lepidosperma laterale*	variable swordsedge	
	HEMEROCALLIDACEAE		
1	*Dianella brevicaulis*	shortstem flaxlily	
	POACEAE		
1 2	*Agrostis capillaris*	brown top bent grass	i
1	*Aira sp.*	hair grass	i
1	*Anthosachne scabra*	rough wheatgrass	
1 2	*Austrostipa sp.*	speargrass	
1	*Briza maxima*	greater quaking-grass	i
1	*Bromus diandrus*	great brome	i
2	*Cynodon dactylon var. dactylon*	couchgrass	i
1	*Cynosurus echinatus*	rough dogstail	i
1 2	*Dactylis glomerata*	cocksfoot	i
1	*Ehrharta sp.*	ricegrass	
1	*Poa rodwayi*	velvet tussockgrass	
1 2	*Poa sp.*	poa	
2	*Rytidosperma sp.*	wallabygrass	
2	*Vulpia sp.*	fescue	i

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APPENDIX B – THREATENED FLORA SPECIES FROM WITHIN 5 KM[17]

Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Habitat	Likelihood of Impact	Commentary
Acacia axillaris midlands wattle	Vulnerable / Vulnerable	0 / 1	Mainly confined to riparian habitats such as dense riparian scrub and associated floodplains but also extends to paddocks and open grassy forests in frost hollows and areas of poor drainage. It also occasionally occurs on rocky slopes. All populations are strongly associated with dolerite.	**None**	The project area lies outside the natural range of this species, and the nearby record refers to a cultivated specimen. There is no likelihood of the species occurring on-site.
Aphelia gracilis slender fanwort	Rare / -	0 / 1	Inhabits damp sandy ground and wet places in the Midlands and north-east of the State. It may readily colonise sites after fire or other disturbance.	**None**	The project area lacks wet and damp areas required for this species. It is not considered likely to occur on-site.
Atriplex suberecta sprawling saltbush	Vulnerable / -	0 / 2	Wide range of habitats on most soil types, including saline areas, but is most commonly found in disturbed areas.	**None**	The waterfront area, which presents the highest likelihood of being suitable for this species, was surveyed and the species was not observed. It is not commonly recorded in the area, with only two records within 5 km, the most recent of which dates to 1999. As such, the species is not considered to be present on-site.
Austrostipa bigeniculata doublejointed speargrass	Rare / -	0 / 2	Open woodland and grasslands with fertile soils.	**Low**	The NAV within the project area is not considered as open woodland. In more open sections, the vegetation is heavily disturbed, with significant infestations of declared weeds. This species is uncommon in the vicinity, with the most recent observation within a 5 km radius recorded in 2007. Therefore, it is not anticipated to be present within the project area.
Bolboschoenus caldwellii sea clubsedge	Rare / -	0 / 28	Widespread in shallow, standing, sometimes brackish water, rooted in heavy black mud.	**None**	The shoreline is rocky and open, lacking the silty or muddy conditions preferred by this species. It

[17] Department of Natural Resources and Environment (2025)

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Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Habitat	Likelihood of Impact	Commentary
					was not observed during the survey and is not considered to be present on-site.
Caladenia caudata tailed spider-orchid	Vulnerable / Vulnerable	0 / 20	Highly variable habitat on a range of substrates. Typically found in heathy forest.	**Low**	Given the small size of the project area and its urbanised, modified nature, aswell as absence of known records within a 500 m radius, particularly for a species that is closely monitored by the local orchid community, it is considered highly unlikely that this species is present on-site.
Caladenia filamentosa daddy longlegs	Rare / -	0 / 1	Heathy and sedgy eucalypt forest on sandy soils.	**Low**	The project area lacks suitable habitat for this species. The only record within 5 km dates back to 1947, and the species is not considered to be present in the area.
Carex gunniana mountain sedge	Rare / -	0 / 1	Wet eucalypt forest, sandy heathlands, margins of streams, littoral sands, shingle with seepage, damp grasslands within dry forest and rough pasture.	**None**	The project area lacks suitable habitat for this species. The only record within 5 km dates back to 1894, and the species is not considered to be present in the area.
Damasonium minus starfruit	Rare / -	0 / 1	In Tasmania, *Damasonium minus* occupies swampy habitat and farm dams and prefers slow flowing or stationary water.	**None**	The project area lacks suitable swampy habitat for this species. The only record within 5 km dates back to 1917, the species is not considered to be present in the area.
Diuris palustris swamp doubletail	Endangered / -	0 / 5	In Tasmania, the species occurs in coastal areas. It is found in grassy open eucalypt forest, sedgy grassland and heathland with tea-tree and paperbark on poorly to moderately drained sandy peat and loams, usually in sites that are wet in winter, hence its common name.	**None**	The project area lacks suitable habitat, and the species is considered possibly extinct at sites within 5 km. Therefore, it is not considered to be present in the area.
Eucalyptus morrisbyi Morrisby's gum	Endangered / Endangered	0 / 2	Occurs in coastal, dry sclerophyll woodland on gentle to hilly slopes with poor drainage. It tends to be restricted to gullies that offer some relief in this drought-prone, low-rainfall area. It is associated	**None**	The species is restricted to only two natural populations at Calverts Hill and Risdon. Nearby records relate to specimen trees, and it does not occur within the project area.

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Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Habitat	Likelihood of Impact	Commentary
			with poor soils. The Calverts Hill subpopulation and associated remnant stands occur on recent sands overlying dolerite, and the Risdon subpopulation occurs on Permian mudstone.		
Eucalyptus risdonii Risdon peppermint	Rare / -	0 / 1	This species is found on Permian mudstone from sea level to 150 m. Habitat includes low open forest on very sunny ridges and northwest-facing upper slopes, most commonly in the Meehan Range.	**None**	The project area lies outside the natural range of the species and lacks the mudstone substrate it requires. Consequently, the species does not occur within the project area.
Goodenia paradoxa spur velleia	Vulnerable / -	0 / 5	In Tasmania, *Velleia paradoxa* is known from the Hobart and Launceston areas, the Midlands and the Derwent Valley, where it occurs in grassy woodlands or grasslands on dry sites.	**Low**	Although flowering material is required to confirm the species identity, it is easily detectable from old seed heads and resprouting leaves during early winter, none of which were observed during the survey. As the species is not common in the area, with the nearest known records from a comparatively large remnant patch of dry *Eucalyptus pulchella* forest ~ 2 km north, it is considered unlikely to be present within the project area.
Gratiola pubescens hairy brooklime	Rare / -		Permanently or seasonally damp, swampy ground, including the margins of farm dams.	**None**	The project area lacks damp and swampy areas required for this species. It is not considered likely to occur on-site.
Haloragis aspera rough raspwort	Vulnerable / -	0 / 1	Haloragis aspera is found only in wet areas in the north, north-east and south-east.	**None**	The only record of this species within 5 km dates back to 1895. The project area lacks suitable wet habitat for the species and is therefore not considered to occur on-site
Haloragis heterophylla variable raspwort	Rare / -	0 / 1	Poorly drained sites (sometimes only marginally so), which are often associated with grasslands and grassy woodlands with a high component of *Themeda triandra*. Also occurs in grassy/sedgy *Eucalyptus ovata* forest and woodland, shrubby	**None**	The project area lacks suitable wetland and grassland habitat for the species. With only one record within 5 km, it is not considered to occur on-site.

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Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Habitat	Likelihood of Impact	Commentary
			creek lines, and broad sedgy/grassy flats, wet pasture and margins of farm dams.		
Hibbertia basaltica basalt guineaflower	Endangered / Endangered	0 / 2	Sandy heaths and open woodlands in the north-east.	**Low**	This species is found 4 km east on the meander range. Given the project area lacks sandy heath habitat and the NAV vegetation is quite closed and in sections where it is open it is highly disturbed and covered in declared weeds, it is considered very unlikely to be found in habitat in the project area.
Hovea tasmanica rockfield purplepea	Rare / -	0 / 2	Found in open heath, montane shrubbery and woodland in the central regions of Tasmania.	**None**	The two records within 5 km are from the Meehan Range. The project area reaches only 20 m above sea level at its highest point and lacks suitable conditions for the species. It does not occur on-site.
Isoetopsis graminifolia grass cushion	Vulnerable / -	0 / 29	Native grasslands, usually dominated by *Themeda triandra*, or on rock plates, the underlying substrate being mostly basalt or dolerite. The elevation range of recorded sites is 20–360 m above sea level in areas of low rainfall.	**None**	The project area lacks native grassland habitat and rock plate features. It does not occur on-site.
Lachnagrostis robusta tall blowngrass	Rare / -	0 / 1	In saline situations such as the margins of coastal and inland saline lagoons.	**Low**	This species was not observed along the shoreline, and with only one record within 5 km dating to 1943, it is not considered likely to occur within the site.
Lepidium hyssopifolium soft peppercress	Endangered / Endangered	2 / 6	Primarily under large exotic trees on roadsides and in home yards on farms in eastern Tasmania between 0 and 500 m above sea level in dry, warm and fertile areas on flat ground on weakly acid to alkaline soils derived from a range of rock types. Also occurs on frequently slashed grassy/weedy roadside verges where shade trees are absent.	**Low**	*Lepidium hyssopifolium* should be detectable at this time of year. During the survey, *Lepidium africanum*, a non-threatened introduced species, was found growing in several areas. These specimens were carefully examined and verified by Managing Director and experienced botanist Grant Daniels. *Lepidium hyssopifolium* was not observed growing in any suitable habitat within

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Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Habitat	Likelihood of Impact	Commentary
					the site. All occurrences of *Lepidium africanum* were thoroughly mapped and confirmed prior to identification.
Olearia hookeri crimsontip daisybush	Rare / -	0 / 1	The species is found on dry hills around Hobart in the State's south and also along the central east coast. It grows within eucalypt woodlands with a mixed grassy-shrubby understorey, favouring north-northwesterly slopes on mudstone.	**None**	The project area lacks suitable eucalypt woodland habitat for this species. With only one record within 5 km, dating back to 1934, the species is not considered to occur within the site.
Ozothamnus reflexifolius reflexed everlastingbush	Vulnerable / Vulnerable	0 / 17	*Ozothamnus reflexifolius* is known from a single site in the Meehan Range in southeastern Tasmania. The subpopulation is centred on a large dolerite rock plate, with plants occurring in either *Allocasuarina verticillata* (sheoak) woodland, open heath or in crevices in sheer dolerite.	**None**	This species is restricted to a single known site in the Meehan Range and has no likelihood of occurring within the project area.
Parietaria debilis shade pellitory	Rare / -	0 / 3	Found growing around muttonbird rookeries, on cliffs/rocks in the salt spray zone and in moist shaded areas in dune scrubs.	**Low**	The site lacks dune scrub characteristics, and no plants with similar vegetative features were observed on the rocky foreshore area.
Phyllangium divergens wiry mitrewort	Vulnerable / -	0 / 2	A wide variety of near-coastal habitats on a range of substrates, a common feature usually being bare ground (e.g. tracks) and rock exposures (outcrops, coastal cliffs, etc.).	**Low**	This species was last recorded within 5 km of the site in 1911. As there have been no subsequent sightings since then, the species is considered highly unlikely to occur on-site.
Pimelea curviflora curved riceflower	Rare / -	0 / 1	Wet and dry sclerophyll forest to hardwood plantations. Understoreys vary from open and grassy to densely shrubby. It can densely colonise disturbed sites such as firebreaks, log landings and tracks.	**Low**	Within 5 km a single record of the species exists approximately 4.9 km south of the site, dating back to 1945. As there have been no subsequent sightings since then, the species is considered highly unlikely to occur on-site.

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Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Habitat	Likelihood of Impact	Commentary
Pterostylis ziegeleri grassland greenhood	Vulnerable / Vulnerable	0 / 1	The east and north of Tasmania. In coastal areas, the species occurs on the slopes of low stabilised sand dunes and in grassy dune swales, while in the Midlands it grows in native grassland or grassy woodland on well-drained clay.	**None**	The site lacks sandy or clay soils, which are preferred by the species. The nearest record is located approximately 3 km to the east, in the hills of the Meehan Range, and dates back to 1911. The species is therefore considered extremely unlikely to be present on-site.
Ruppia megacarpa largefruit seatassel	Rare / -	0 / 4	In Tasmania, it is found growing in estuaries and lagoons along the east and south-east coasts, and in brackish lagoons in the Midlands; there is also an historic record from the Tamar estuary in the State's north.	**Low**	The project area is confined to land and borders the shoreline. This species was not observed within the immediate shoreline zone. However, if the project is proposed to extend into the bay, additional survey work would be required to confirm the species' absence.
Scleranthus fasciculatus spreading knawel	Vulnerable / -	0 / 8	*Poa* grassland/grassy woodland. It appears to need gaps between the tussock spaces for its survival and both fire and stock grazing maintain the openness it requires. Often found in areas protected from grazing, such as fallen trees and branches.	**Low**	This species prefers native grassland habitat; however, the vegetation on-site lacks substantial grass cover. It is therefore not considered likely to occur within the site.
Senecio squarrosus leafy fireweed	Rare / -	0 / 13	Dry grassy forests but can extend into wet forests and other vegetation types.	**Low**	Given the fragmented and modified nature of the site, this species is considered unlikely to occur. It is also typically detectable at this time of year, but was not observed during the survey.
Spyridium eriocephalum MacGillivray spiridium	Endangered / -	0 / 2	Occurs in a range of vegetation types, mainly shrubby dry sclerophyll forests and woodlands. It can proliferate from soil-stored seed after disturbance.	**None**	Known in southern Tasmania from a population in riston, the species is therefore considered extremely unlikely to be present on-site.
Stuckenia pectinata fennel pondweed	Rare / -	0 / 1	Submerged in fresh to brackish/saline waters in rivers, estuaries and inland lakes.	**Low**	The project area is confined to land and borders the shoreline. This species was not observed within the immediate shoreline zone. However, if the project is proposed to extend into the bay,

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Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Habitat	Likelihood of Impact	Commentary
					additional survey work would be required to confirm the species' absence.
Teucrium corymbosum forest germander	Rare / -	0 / 39	Occurs in a wide range of habitats from rocky steep slopes in dry sclerophyll forest and *Allocasuarina* woodland, riparian flats and forest.	**Low**	This species has been recorded within 5 km, on the slopes of the Meehan Range. It is typically detectable at this time of year but was not observed during the survey. It is therefore not considered likely to occur on site.
Tricoryne elatior yellow rushlily	Vulnerable / -	0 / 1	Native grassland, grassy woodland, and forest.	**None**	The project area lacks native grassland or grassy woodland, and with the only known record within 5 km dating back to 1881, this species is not considered to occur on site.
Uncinia elegans handsome hooksedge	Rare / -	0 / 1	Wet and dry sclerophyll forests and open grassy woodlands. Mostly associated with damp grassy habitats.	**None**	The project area lacks damp, grassy habitat, and with only a single record from within 5 km dating back to 1996, the species is considered very unlikely to be present on site.
Vittadinia cuneata var. *cuneata* fuzzy new-holland daisy	Rare / -	0 / 2	Native grassland and grassy woodland on fertile soils, typically overlying basalt.	**None**	This species is uncommon in the area, with the most recent record within 5 km dating back to 1991. Given the absence of native grassland and grassy woodland within the project area, the species is not considered to occur on site.

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APPENDIX C – THREATENED FAUNA SPECIES[18] FROM WITHIN 5 KM (BASED ON RECORDS AND RANGE BOUNDARIES)[19]

Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Potential to Occur	Observations and Preferred Habitat	Commentary
MAMMALS					
Dasyurus maculatus maculatus spotted-tailed quoll	Rare / Vulnerable	0 / 1	Denning: Low Foraging: Low	This naturally rare forest-dweller most commonly inhabits wet forest but also occurs in dry forest. It forages and hunts on farmland and pasture, travelling up to 20 km at night, and shelters in logs, rocks or thick vegetation. Important habitat includes large patches of forest containing adequate denning sites and high densities of mammalian prey.	The narrow, dry strip of *Allocasuarina verticillata* forest within the project area is not considered suitable habitat for this species. The vegetation is highly fragmented and situated within a predominantly urban setting, further reducing its habitat value. With only one record within 5 km, the species is considered unlikely to occur on-site. Therefore, the project is not expected to impact this species.
Dasyurus viverrinus eastern quoll	Endangered / Endangered	0 / 9	Denning: Low Foraging: Low	Occurs in most parts of Tasmania but is recorded infrequently in the wetter western third of the state. This species' distribution is associated with areas of low rainfall and cold winter minimum temperatures. It is found in a range of vegetation types including open grassland (including farmland), tussock grassland, grassy woodland, dry eucalypt forest, coastal scrub and alpine heathland, but is typically absent	The native vegetation within the project area provides some suitable habitat features for this species. However, the vegetation is highly fragmented and located within an urban setting. Nearby records are from the edges of larger native forest areas or from now-urban locations, with records predating the clearing of native vegetation. As such, the species has a low likelihood of

[18] Excludes marine and strictly coastal species that have no chance of occurring.
[19] Department of Natural Resources and Environment (2025)

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Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Potential to Occur	Observations and Preferred Habitat	Commentary
				from large tracts of wet eucalypt forest and rainforest.	occurring on-site, and the project is not expected to impact it.
Sarcophilus harrisii Tasmanian devil	Endangered / Endangered	0 / 26	Denning: Low Foraging: Low	This species occupies a wide range of habitats across Tasmania and exploits landscapes with a mosaic of pasture and forest with elevated prey densities; it is attracted to roadkill hotspots with concentrated scavenging resource. The protection of breeding opportunities is particularly important for the species due to the mortalities from demographic pressures. This species is known to den in log hollows and wombat burrows.	This species is known to utilise a wide range of habitats, including mosaics of modified areas adjacent to native vegetation. However, the native vegetation within the project area is considered too small and fragmented to support a population. All nearby records are from the edges of larger native forest areas or from now-urban locations, with records predating the clearing of native vegetation. As such, the species is considered to have a low likelihood of occurring on-site, and the project is not expected to impact it.
BIRDS					
Accipiter novaehollandiae grey goshawk	Endangered / -	0 / 30	Nesting: None Foraging: Low	Inhabits large tracts of wet forest and swamp forest, particularly patches with closed canopies above an open understorey, but with dense stands of prey habitat nearby. Mature trees provide the best nesting sites. Most nests have been recorded from blackwoods and occasionally myrtle beeches.	This is a wide-ranging species, and while the broader area may form part of its hunting territory, the project area does not provide optimal foraging habitat and lacks suitable nesting features. There is no likelihood that the project will impact this species.
Botaurus poiciloptilus Australasian bittern	- / Endangered	0 / 2	None	A highly cryptic species utilising wetlands and lakes with a dense cover of vegetation.	As the project area lacks the wetland habitat required by this species, no impact to this species is expected.

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Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Potential to Occur	Observations and Preferred Habitat	Commentary
Ceyx azurea diemenensis azure kingfisher	Endangered / Endangered	0 / 2	Nesting: None Foraging: None	The azure kingfisher is found along rivers in the south, west, north and north-west of Tasmania with outlying occurrences in the north-east, east, centre and Bass Strait islands. This species occurs in the forested margins of major river systems where it perches on branches overhanging rivers waiting for prey items such as small fish, insects, and freshwater crayfish to come down the river.	The site contains no suitable habitat features for the species. The banks of the River Derwent onsite consist of basalt rock, lacking any structures suitable for nesting. As such, the project is not expected to impact this species.
Pardalotus quadragintus forty-spotted pardalote	Endangered / Endangered	0 / 6	Nesting: Low Foraging: Low	Endemic to Tasmania and occurs in only a few small areas within the State. It is relatively restricted to dry grassy forest and woodland along the east coast containing mature white gum (*Eucalyptus viminalis*).	One mature *Eucalyptus viminalis* is present onsite, however, the surrounding native vegetation is unsuitable for this species. It is therefore unlikely to utilise the site for nesting or foraging.
Tyto novaehollandiae castanops Tasmanian masked owl	Endangered / Vulnerable	0 / 9	Nesting: None Foraging: Low/Moderate	This species occupies a variety of habitats, typically favouring mature, hollow-bearing forests below 600 m in elevation. These habitats include native forests and woodlands, as well as agricultural areas that retain a mosaic of native vegetation and pasture. Critical habitat is generally restricted to large, hollow-bearing eucalypts (>1 m DBH) within dry eucalypt forest in the species' core range.	Although the area is considered to fall within the core range for the species, the project area itself does not contain any nesting habitat and as it is in a highly modified urban area it is considered to have a low/moderate potential for foraging within the project area.
REPTILES and AMPHIBIANS					

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Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Potential to Occur	Observations and Preferred Habitat	Commentary
Pseudemoia pagenstecheri tussock skink	Vulnerable / -	0 / 0	Low	A ground-dwelling lizard occurring in grassland and grassy woodland habitats at a range of elevations. Recorded in Tasmania in a few disconnected patches of habitat from Midlands, inland Cradle Coast, and eastern Bass Strait islands.	The project area lacks extensive grassland, with existing patches of grass being relatively sparse and fragmented. Given the absence of nearby records, the species is considered to have a low likelihood of occurrence within the project area.
Litoria raniformis green and gold frog	Vulnerable / Vulnerable	0 / 1	None	In Tasmania, this species is found in lowland areas, primarily on the coast. It requires permanent or temporary water bodies for survival and tends to inhabit ones containing emergent plants such as *Cycnogeton procera* or species of *Juncus* or sedge. The frogs are rarely seen in open water and spend most of their time in vegetation at the water's edges. They depend upon permanent fresh water for breeding, which occurs in spring and summer.	The project area lacks waterbodies, therefore the species will not be impacted by proposed works.
FISH					
Prototroctes maraena Australian grayling	Vulnerable / Vulnerable	0 / 0	None	In Tasmania, the diadromous Australian grayling has been found in northern, eastern and western rivers. Little is known of the population size. The major threat to the species is the construction of barriers that prevent adult fish from moving upstream and juveniles, downstream.	No rivers or streams are present within the project area, the species will therefore not be impacted by proposed works.

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Species	Status TSPA / EPBCA	Records within 500 m / 5 km	Potential to Occur	Observations and Preferred Habitat	Commentary
INVERTEBRATES					
Antipodia chaostola chaostola skipper	Endangered / Endangered	0 / 0	None	This species is restricted to dry forest and woodland supporting the sedge *Gahnia radula* and occurs in isolated populations in south-eastern and eastern Tasmania.	No occurrences of *Gahnia radula* were found onsite. Due to the lack of available habitat the species will not be impacted by proposed works.
Discocharopa vigens ammonite pinwheel snail	Endangered / Critically Endangered	0 / 0	Low	This snail has been recorded from seven locations in the Hobart metropolitan area: Mt Wellington, Mt Nelson, The Domain, Hillgrove, Grasstree Hill, South Hobart and Austins Ferry. The species is thought to be extinct on Mt Nelson. Habitat of the species includes dry and wet eucalypt forests below 400 m in altitude. To date the species has been found only under dolerite rocks.	The project area lacks eucalypt forest, there are a small number present on the eastern side of NAV vegetation. Given the absence of nearby records, the species is considered to have a low likelihood of occurrence within the project area.
Theclinesthes serpentatus lavara chequered blue	Rare / -	0 / 1	None	It is found in wetland/saltmarsh habitats as it exploits various widespread chenopods as foodplants during its caterpillar stage, including *Rhagodia candolleana* (coastal saltbush) and species of *Atriplex.*	The project area contains no saltmarsh or wetland habitat, therefore the species will not be impacted by proposed works.

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Cadbury Experience Project

Slope Stability Report

Prepared for

Chocolate Experience No. 2 (Simon Current and Associates and partner investors)

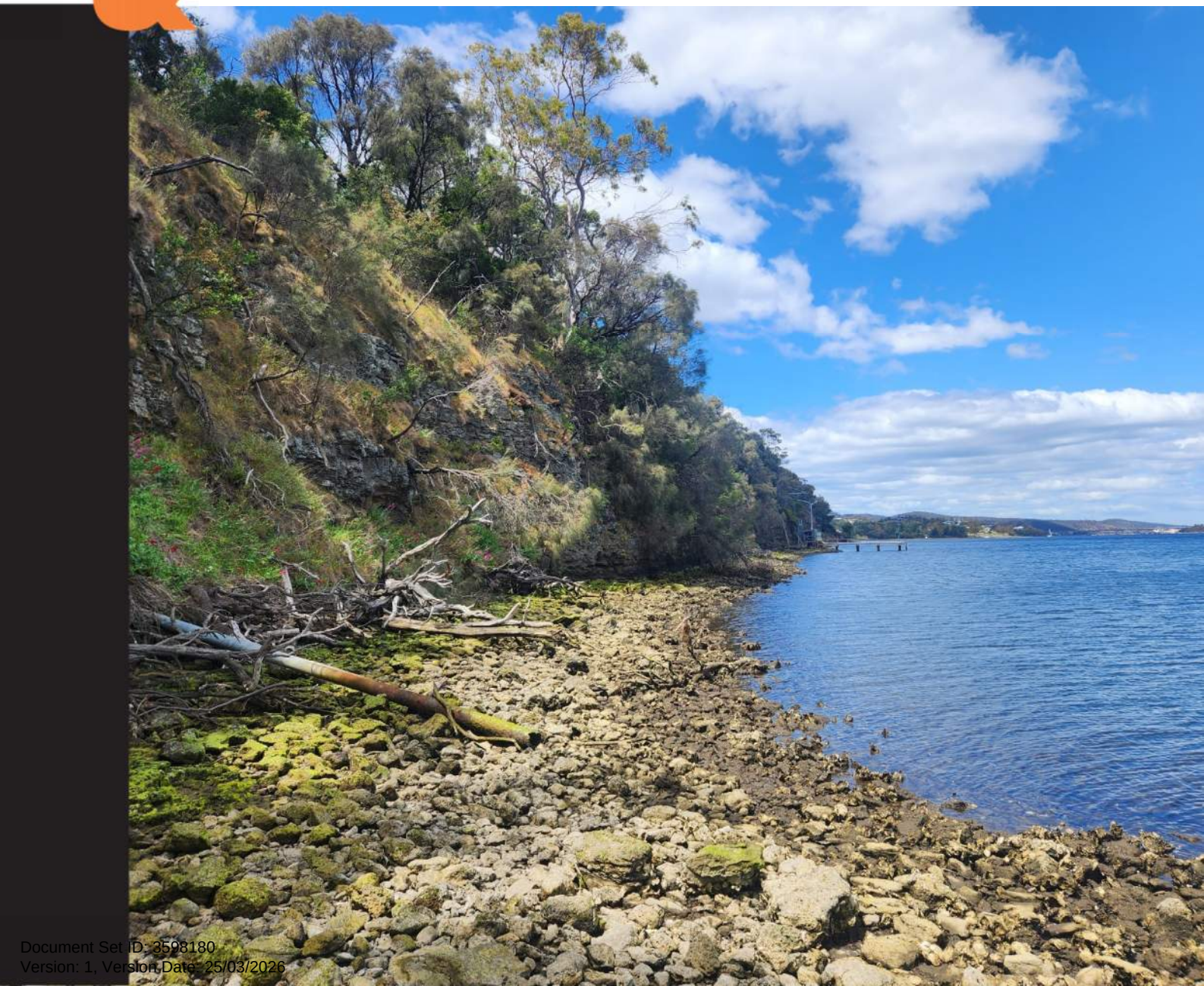
Client representative

Michelle Mhemba

Date

09 September 2025

Rev02



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Prepared by — Andrew Tyson		**Date —** 29 August 2025
Reviewed by — Kieran O'Connor		**Date —** 29 August 2025
Authorised by — Kieran O'Connor		**Date —** 29 August 2025

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
00	Final	AT	NP	NP	27/11/2024
01	Amended for new building, jetty and walkway locations	AT	KOC	KOC	29/8/2025
02	Minor amendment to wording	AT	KOC	KOC	9/9/2025

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1. Purpose

The primary purpose of this report is to demonstrate that the proposed Cadbury Experience Project can comply with the applicable provisions of the Tasmanian Planning Scheme - Glenorchy.

The proposed development consists of a building and associated infrastructure on a currently unoccupied part of the Cadbury site, near the coastal cliffs overlooking Windermere Bay. Additionally, the concept includes a new jetty and pathway up to the site of the Chocolate Experience building.

The assessments below are separated into two main sections; one for the building and nearby infrastructure, and one for the jetty and pathway.

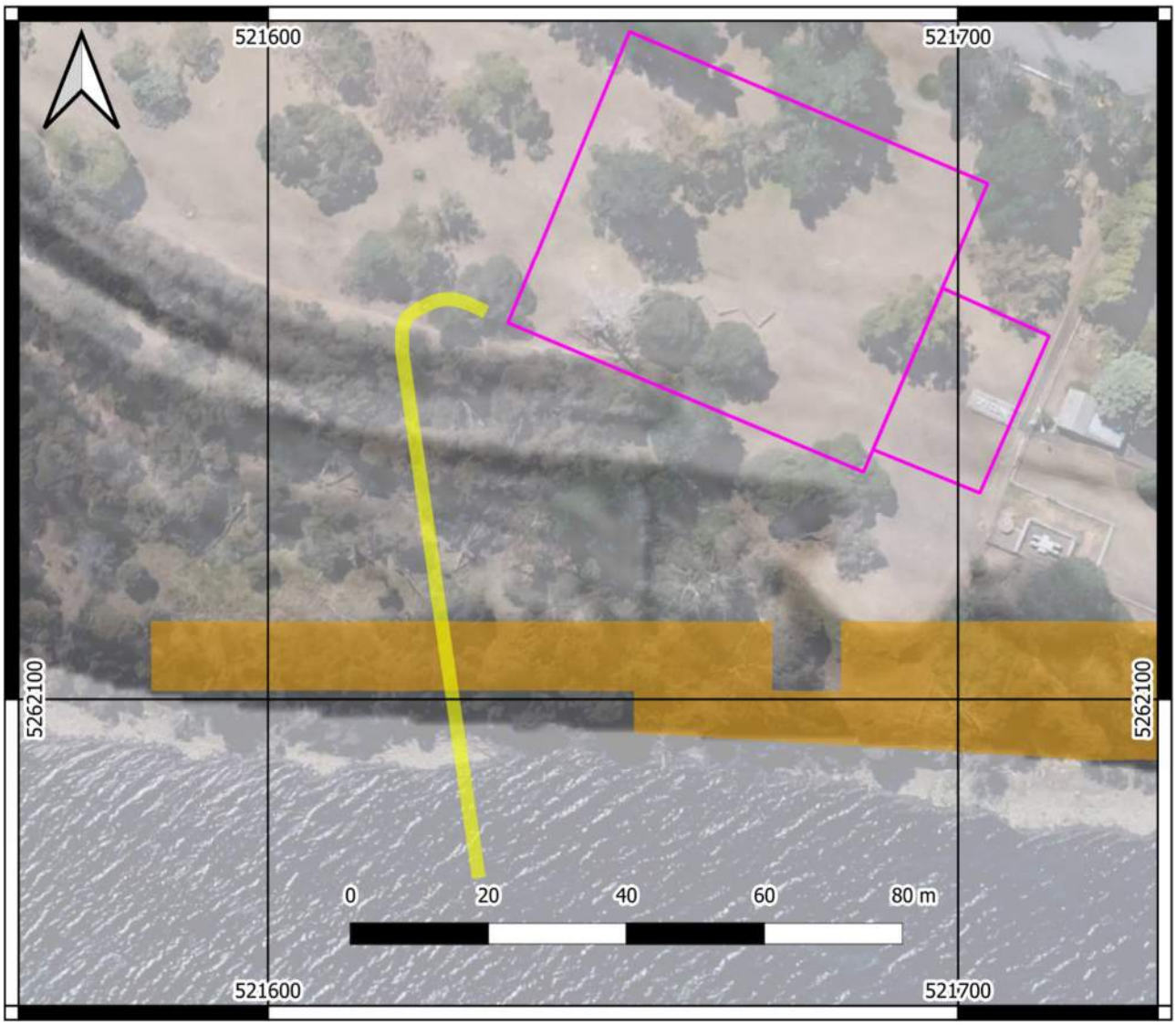


Figure 1: Site plan showing proposed building envelope (pink); walkway option (yellow); medium landslide hazard band in orange

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2. Landslip Risk Assessment

The section of medium landslide hazard band identified in Figure 1 above is further defined as “rockfall susceptibility source and runout area 34°” in the Landslide Planning Map – Components layer accessed through the ‘LISTmap’ website. This area has been defined by an algorithm based on the underlying geology and the slope angle at the site.

The area at the top of the cliffs has been mapped as Cenozoic age conglomerate and sandstone, while the cliffs are mapped as basalt. Both of these lithologies were observed on site, with the additional note that the basalt was extremely vesicular (extensive gas bubbles) and comprised of several basalt flows stacked on top of each other. The basalt flows at the base of the cliffs appear to have erupted underwater, and show extremely vesicular centres which have become the focus of erosion. The highly vesicular nature of the basalt increases the rate at which it erodes following exposure to air and water, and these erosive areas lead to new rockfall sites.

2.1 Cadbury Experience Area

The area where the Cadbury Experience building is proposed slopes gently towards the south. Areas in the vicinity have been modified by previous cut and fill works over the years, but the current proposed building envelope does not intersect any areas that are interpreted to have significant fill thickness.

There are no indications of instability in or near the proposed building envelope.

When designing the Cadbury Experience it will be important to ensure that foundations are extended into competent rock, and it is recommended that investigations are extended a suitable distance below founding layers as the basalt shows a propensity for voids and other strength changes. These recommendations will be most appropriately considered during the detailed design stage.

2.2 Jetty and Walkway

The proposed jetty is to be situated a short distance offshore to the south of the proposed Cadbury Experience buildings. Given the distance from the cliff edge, it is unlikely that rockfall or other stability issues will affect this location. The cliff edges around much of the coast below the Cadbury site are unstable and show many examples of recent rockfall (Figure 2). Any significant works undertaken from the coast in the vicinity of the proposed jetty location should be preceded by scaling works to reduce the risk of rockfall impacting on personnel working in the area. The risk has not been quantified at this point due to the lack of information regarding how much temporal exposure may be required for any works, however it is anticipated that a suitable scaling programme will be sufficient to keep risks in the tolerable to acceptable range.

The design for the walkway incorporates offshore stairs to bring pedestrians above the level of the cliff top before the shoreline is reached. Once the walkway reaches land, the pathway up to the proposed Cadbury Experience site proceeds along moderately steep slopes that do not show surface rock. As such, rockfall exposure in this section is considered very low.

There is potential for rockfall to impact on the supports for the elevated part of the walkway. This risk will be most appropriately considered during the detailed design stage when the locations of the supports are determined.

As with the jetty construction, any works undertaken from the coast in the vicinity of the proposed jetty location should be preceded by scaling works to reduce the risk of rockfall impacting on personnel working in the area. The risk has not been quantified at this point due to the lack of information regarding how much temporal exposure may be required for any works, however it is anticipated that a suitable scaling programme will be sufficient to keep risks in the tolerable to acceptable range.

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Figure 2: Recent rockfall on the shoreline beside Cadbury

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3. Landslide Code

As the planning assessment below demonstrates that the proposed development complies with the applicable standard, the proposal can reasonably be considered to be consistent with the purpose of the code, which is:

- C15.1.1 To ensure that a tolerable risk can be achieved and maintained for the type, scale and intensity and intended life of use or development on land within a landslip hazard area.

3.1 Use Standards

The uses standards are not applicable for the following reason:

- The proposed use is not a critical, hazardous or vulnerable use, so it is exempt under Clause C15.4.1 (a)

3.2 Development Standards

The following development standard does not apply:

- C15.7.1 Subdivision within a landslip hazard area (the proposal does not include subdivision).

C15.6.1 Building and works within a landslip hazard area

Objective: That building and works on land within a landslip hazard area can:

(a) minimise the likelihood of triggering a landslip event; and
(b) achieve and maintain a tolerable risk from a landslip.

Acceptable Solution	Performance Criteria
A1 No acceptable solution.	P1.1 Building and works within a landslip hazard area must minimise the likelihood of triggering a landslip event and achieve and maintain a tolerable risk from landslip, having regard to: (a) the type, form, scale and intended duration of the development; (b) whether any increase in the level of risk from a landslip requires any specific hazard reduction or protection measures; (c) any advice from a State authority, regulated entity or a council; and (d) the advice contained in a landslip hazard report. P1.2 A landslip hazard report also demonstrates that the buildings and works do not cause or contribute to landslip on the site, on adjacent land or public infrastructure. P1.3

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	If landslip reduction or protection measures are required beyond the boundary of the site the consent in writing of the owner of that land must be provided for that land to be managed in accordance with the specific hazard reduction or protection measures.

Assessment

The proposed development satisfies P1.1 for the following reasons:

(a) The foundations for the proposed Chocolate Experience are outside the landslide hazard zones, as is the majority of the walkway. These are intended to be permanent structures.
(b) The rockfall hazard associated with the construction of the jetty and walkway is likely to be managed by scaling. The resultant risk if such measures are planned and executed appropriately will be tolerable, and this risk level will be able to be maintained.
(c) No advice has been provided by a State authority, regulated entity or a council.
(d) The advice contained in this landslip hazard report can be considered by the planning authority.

The proposed works do not cause or contribute to landslip on the site, on adjacent land or public infrastructure because there is shallow rock interpreted that can provide suitable founding for construction of the proposed structures. No steepening of the existing slope would be undertaken and therefore the likelihood of instability does not increase. Therefore, the proposal satisfies P1.2.

As no landslip reduction or protection measures are required beyond the boundary of the site, P1.3 is not applicable.

Name and Signature	Role and qualifications	Date
Andrew Tyson	Associate Engineering Geologist with over 20 years' experience	28/08/2025

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Important information about your report

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Cadbury Experience Project

Slope Stability Report

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Located nationally —
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CADBURY CHOCOLATE EXPERIENCE VISITOR ARRIVALS ASSESSMENT

Prepared for Glenorchy City Council by
Evolve Tourism and BDA Marketing Planning
February 2026

evolvetourism.com

EVOLVE
TOURISM

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Demand Study and Arrivals

Purpose

The purpose of this paper is to provide GCC a view on research supporting visitor forecasts, operating decisions around arrival management and visitor behaviour.

Demand Forecast Context (the research)

The next slides have been prepared by BDA Marketing Planning on behalf of the Cadbury Chocolate Experience.

Simon Currant and Associates have been working with BDA on demand forecasts for 25 years and they are Australia's most experienced and qualified researchers in this field.

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High Statistical Confidence

BDA's Consumer Demand Assessment was conducted with a statistically robust sample.

The total sample for the study was over 1,000 respondents with 603 mainland residents and 403 Tasmanian residents.

This sample provides the following levels of confidence.

- For the mainland sample (n=603) the confidence interval is 4% at the 95% confidence level.
- For the intrastate sample (n=403) the confidence interval is 5% at the 95% confidence level.

The interpretation of this is that we can be 95% confident that a given survey finding among the total relevant mainland popu lation would be within 4 percentage points of the result from our survey sample. This confidence relates to direct survey outputs e.g. appeal, intention, transport preference etc.

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Extracts from Cadbury Chocolate Experience Demand Potential Assessment

September 2025

Cadbury

bda. Marketing Planning

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Background and objectives

- **Background**
  - In 2022, BDA Marketing Planning was engaged to assess the consumer demand potential for a tourism experience at the Cadbury Factory in Hobart
  - This concept has now been further developed and BDA have been engaged to update this assessment for the refined Cadbury Chocolate Experience concept

- **Primary objectives:**
  - To provide an understanding of key market dynamics relevant to a tourism experience in Hobart
  - To provide consumer feedback and preferences in relation to various elements of the experience
    - And to identify which have the most impact on driving demand potential
  - To provide an understanding of the characteristics and behaviour of the potential market for the experience
  - To provide estimates of future demand for the proposed experience

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Consumer Research Methodology

- **BDA conducted the research via an online survey**
  - The sample were 1006 respondents, 603 from the interstate market and 403 from Tasmania
  - All interstate respondents had travelled for leisure in the last 2 years and were considering visiting Tasmania in the next 3 years
  - Respondents were asked pre-stimulus questions relating to demographics and general travel
  - Respondents were shown stimulus of Hobart and its major attractions and a range of feedback gathered on the destination
  - Respondents were then shown information regarding the Cadbury Chocolate Experience and Mona in a randomised order and asked about appeal, elements of appeal. intention, etc
  - Respondents were then shown two potential lower price options for the Cadbury experience and their impact on intention was measured
  - Finally, respondents were shown an option regarding an option for a joint ferry option for both Mona and Cadbury with a range of questions asked about this impact

Introductory questions i.e. demographics, qualifiers, general travel

Respondents were shown information on Hobart



Questions on appeal, elements of appeal, intention, etc

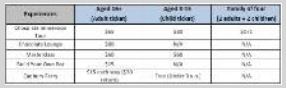
Respondents were shown information on Cadbury & Mona



Questions on appeal, elements of appeal, intention, etc

Two price drops were introduced

Price drop #1



Price drop #2



Impact on intention at each price point was measured

The joint Mona ferry option was introduced

"There is an additional option where you can take a single ferry from central Hobart and engage in both experiences in a single day i.e. Mona and Cadbury. This would require only one return ferry ticket to visit both experiences." This joint ferry would cost an additional $10 per person for the return journey ($40 return per person)

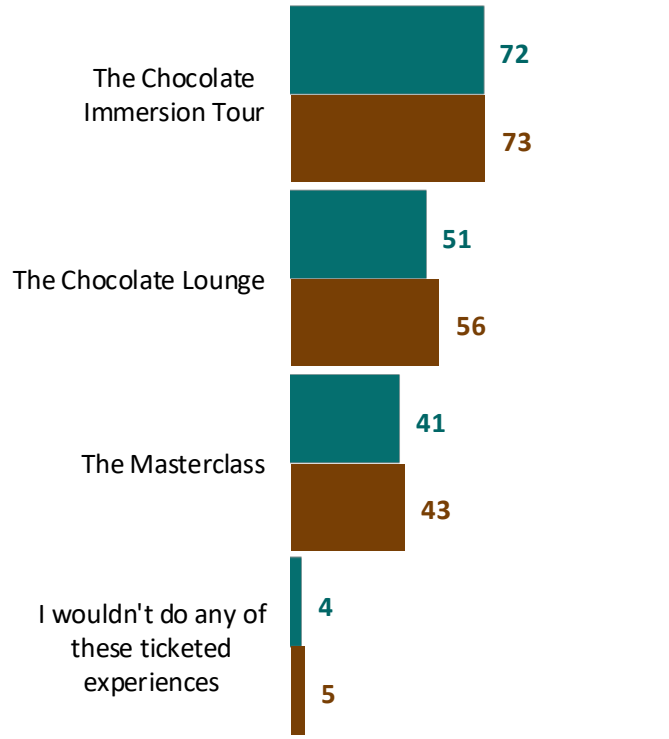
Questions on impact on intention, and visitation preferences

Experience intention

- **Strong interest in a range of experiences at Cadbury**
  - For those intending to visit Cadbury, over 70% would do the Chocolate Immersion Tour, while many would also be keen to engage in the Chocolate Lounge and Masterclass
- **Almost 80% would go to the Emporium and a majority would visit the café (stronger with Tasmanians)**
- **Over 80% of interstate would build their own bar, 72% of Tasmanians**

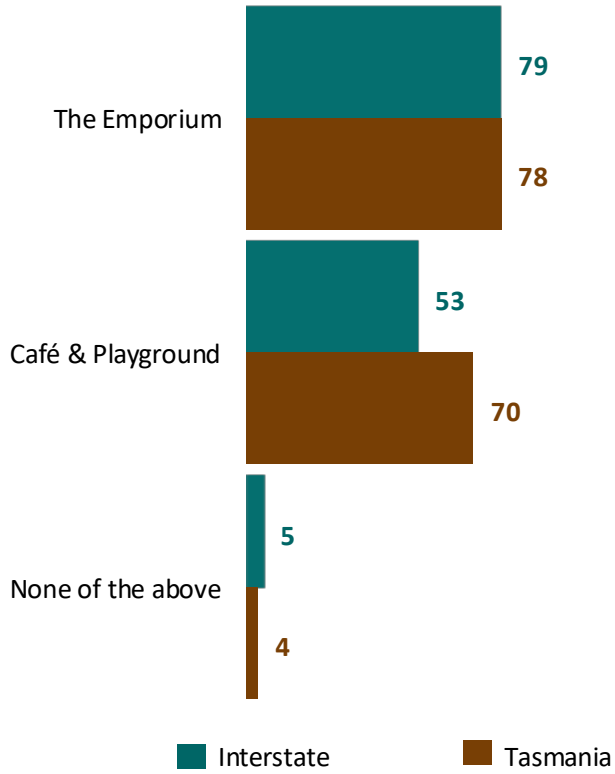
Ticketed experiences

% of those very likely to certain to visit Cadbury



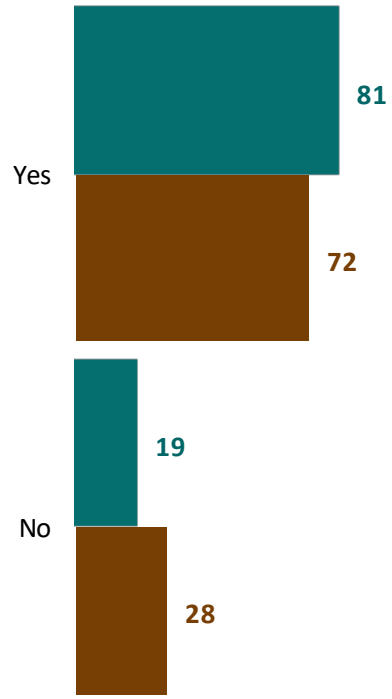
Free to public experiences

% of those very likely to certain to visit Cadbury



Build your own bar

% of those very likely to certain to visit Cadbury



Question: If you were to visit the Cadbury Chocolate Experience which (if any) of the following ticketed experiences would you do? Thinking about the elements of the Cadbury Chocolate Experience which are open to the public, which (if any) of the following would you engage in? If you were to visit the Cadbury Chocolate Experience, would you choose to do the 'Build Your Own Bar' experience ($20 per bar or 3 for $50)?

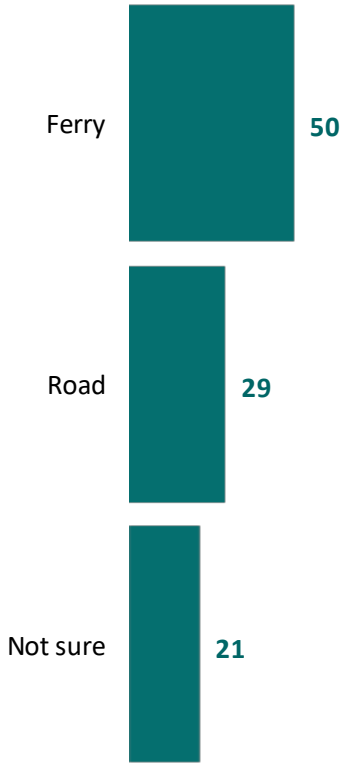
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Cadbury Chocolate Experience - Visitation preferences

- **1/2 of interstate visitors intend to come via ferry compared to 19% of Tasmanians, 73% of Tasmanians intend to visit via road and 29% of interstate**

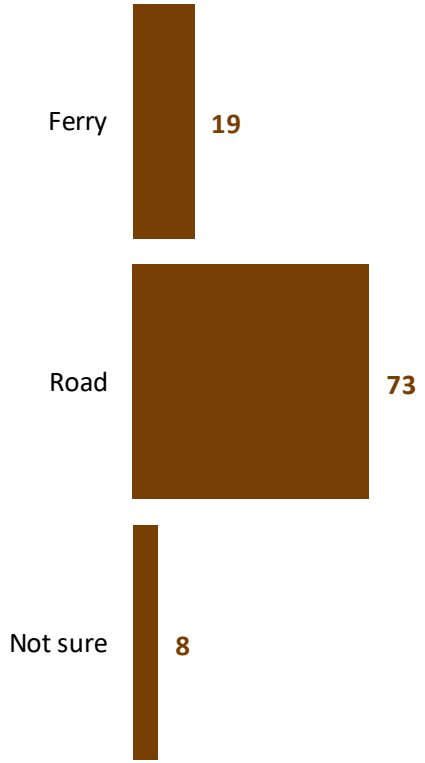
Ferry vs Road - Interstate

% of those very likely to certain to visit Cadbury



Ferry vs Road - Tasmania

% of those very likely to certain to visit Cadbury



Q. You said you'd be [answer] to visit Cadbury in the next 2 years. How do you think you would you get there?

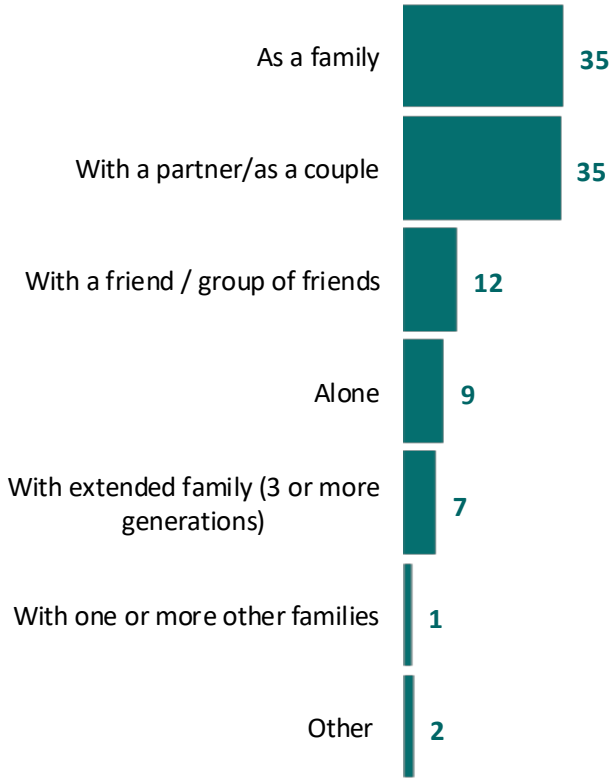
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Cadbury Chocolate Experience - Travel party

- **For interstate visitors, an equal proportion would visit as a family and as a couple**
- **Tasmanians most likely to travel as a family**

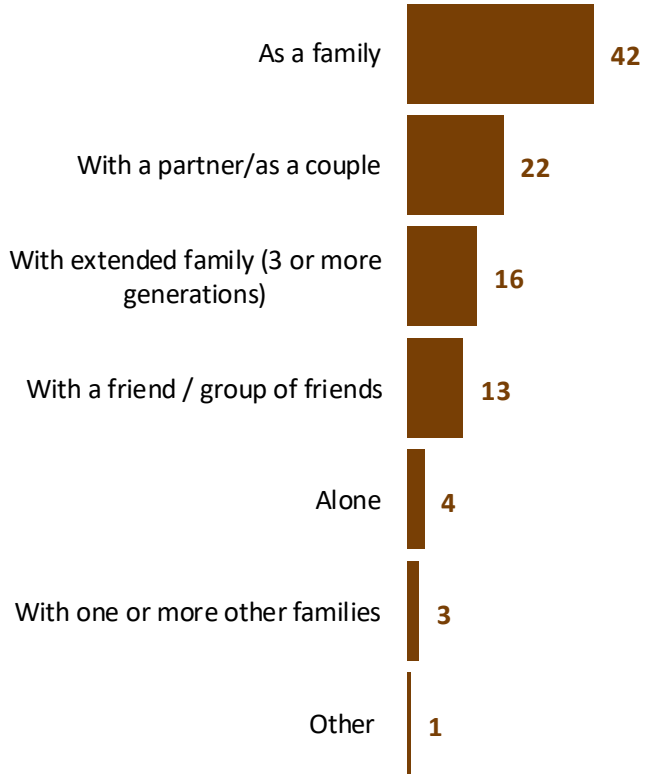
Intended travel party - Interstate

% of those very likely to certain to visit Cadbury



Intended travel party - Tasmanian

% of those very likely to certain to visit Cadbury



Q. If you were to engage in the Cadbury experience, who would you most likely visit with on this trip?

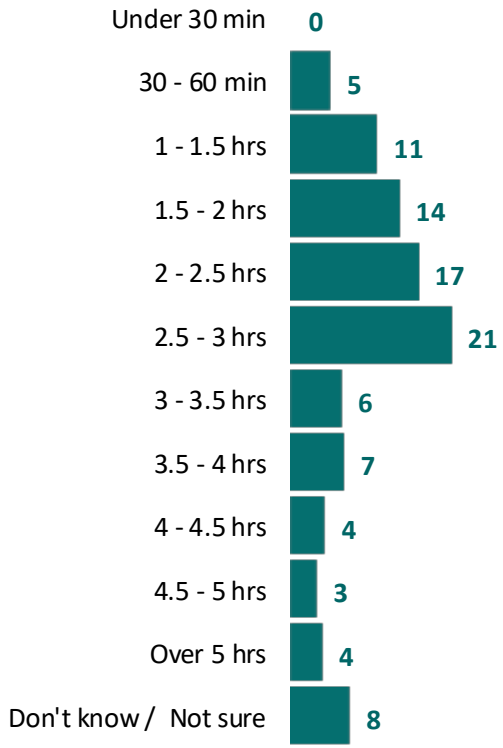
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Cadbury Chocolate Experience - Length of visit

- 1.5-3 hours are the most common intended lengths of stay for both interstate and Tasmanians
- Similar pattern for both groups, interstate visitors are more likely to stay for over 4 hours

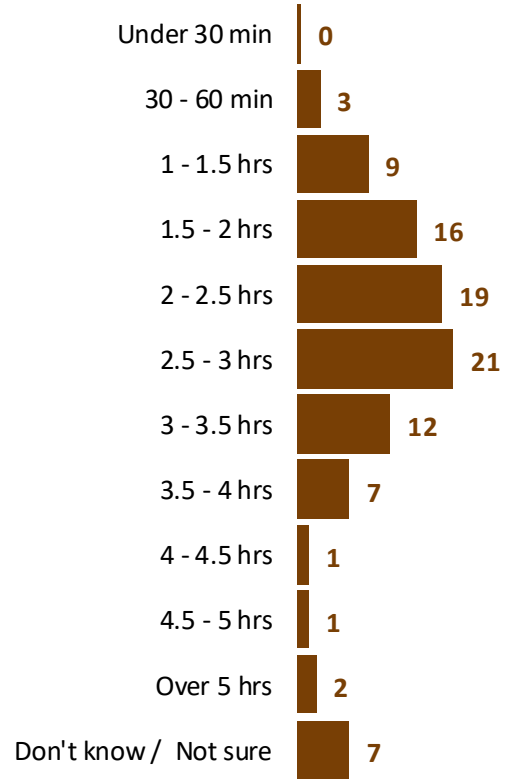
Length of stay at Cadbury - Interstate

% of interstate respondents very likely to certain to visit Cadbury



Length of stay at Cadbury - Tasmania

% of Tasmanian respondents very likely to certain to visit Cadbury





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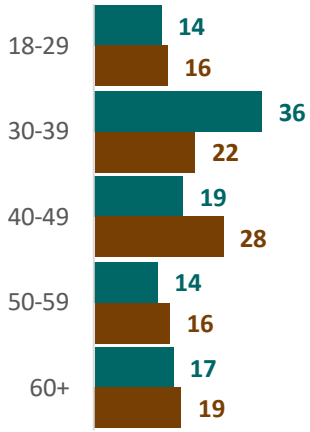
Cadbury Chocolate Experience - Intenders demographics

- **A mix of demographics are attracted to the Cadbury Chocolate experience**
- Interstate intenders are most likely to be aged 30-39, though there are plenty of intenders across other age groups
  - Melbourne is the most common location though NSW also prominent
- Interstate intenders are likely to be working full time, across a spread of income groups
- Intenders from Tasmania a little older, lower income and less likely to be working full time

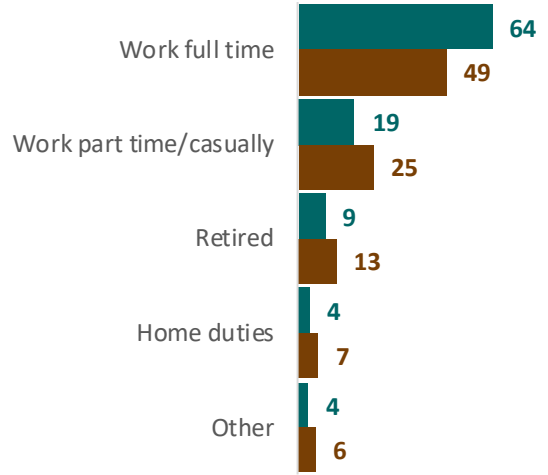
Cadbury Experience intenders from interstate

Cadbury Experience intenders from Tasmania

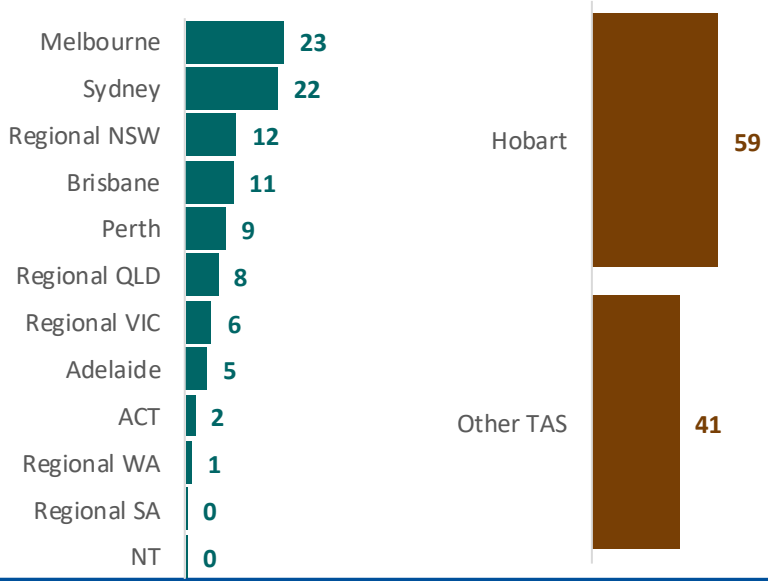
Age



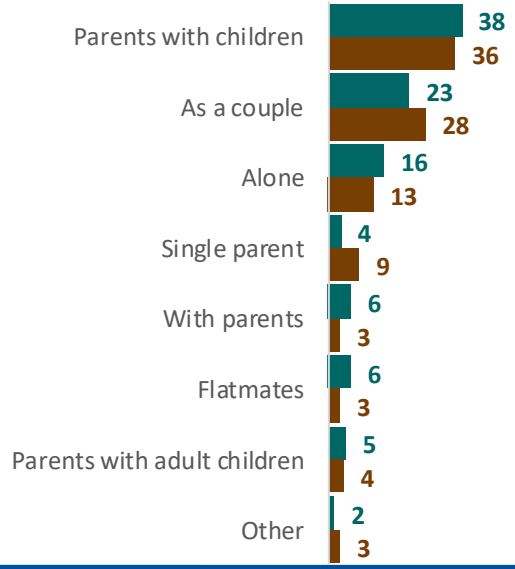
Employment



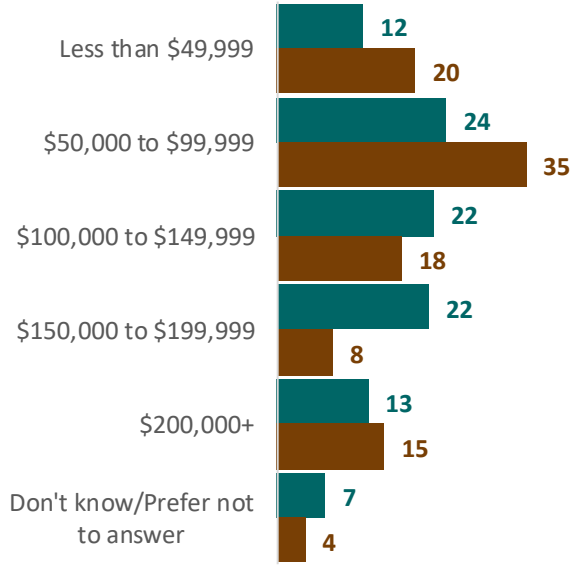
Location



Living situation



Household Income bracket



Cadbury Chocolate Experience - Demand Potential Projections for first 5 years

Baseline Demand Potential

	Visitors to ticketed experiences				Potential non-ticketed visitors
	Interstate / International	Intrastate	Total		
Year 1 (YT Dec 28)	334k	78k	412k		19k
Year 2 (YT Dec 29)	340k	80k	420k		19k
Year 3 (YT Dec 30)	345k	81k	426k		20k
Year 4 (YT Dec 31)	348k	82k	430k		20k
Year 5 (YT Dec 32)	352k	83k	435k		20k

Disclaimer

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CALCULATIONS AND PLANNING DECISIONS

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Ferry v Road Split Calculations

The table (right) shows the projected visitor numbers and preferred methods of arrival.

This projects 61% of arrivals will be via ferry and 39% via road.

VISITORS P.A.				
Total	431,000			
Intra	86,200	20%		
Interstate & OS	344,800	80%		
ARRIVALS				
	Road	**Ferry**	**Unsure**	
Intra	73%	19%	8%	
Interstate & OS	29%	50%	21%	
ASSUMPTIONS				
Those unsure of arrival for intrastate have been allocated to Road				
Those unsure of arrival for interstate and OS have been allocated to Ferry				
SPLIT				
	Road	**Ferry**	**Totals**	
Intra	69,822	16,378	86,200	
Interstate & OS	99,992	244,808	344,800	
Totals	169,814	261,186	431,000	
Split	**39%**	**61%**		
All inputs from BDA Demand Forecast 2025				

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Insights and Responses

The following table shares the research insights within this extract report and the business response:

INSIGHTS	RESPONSE
• 80% of visitors will be from interstate and overseas • 50% of interstate visitors intend to arrive by ferry and 29% are unsure of a preferred arrival method. • 19% of interstate visitors intend to arrive by ferry and 8% are unsure of a preferred arrival method. • 96% of visitors intend to purchase at least 1 of the 3 available ticketed attractions (Chocolate Immersion Tour 72%; Chocolate Lounge 51%; Master Class 41%)	• The research offers insight to inform the management of visitor arrivals by road or ferry. This insight has allowed the operation to make an informed decision that 61% of tickets will be allocated to ferry arrivals and 39% to road, cycling or walking. • With 96% intending to purchase a ticket, 96% of all arrivals will be managed through ticketing. For example, the experience will only allocate 39% of daily tickets to arrival by road each day and the remaining 61% of tickets will be linked to arrival by ferry. When the road allocated tickets are sold only ferry arrivals will be available for sale. • Tasmanians (20% of visitation) will be more flexible with visitation days and times, quickly learning to avoid busy periods.
79% intend to visit and purchased from the Emporium	The Emporium will not sell any discount Cadbury chocolates. The majority of sales will be from the new premium chocolate range. This will remove the risk of people visiting the retail for discount chocolate.
53% intend to visit and purchased from café (70% Tasmanians)	The café will be highly functional in design to cope with busy volumes. The café is not designed to attract casual visits or become a destination experience.
67% intend to visitor 3 hours or less and 73% 3.5 hours or less	The visitor experience duration and subsequent ferry timetable has been set to meet this need.

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THANK YOU.

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Chocolate Experience at Cadbury

Noise Impact Assessment



Ref: 25068 Cadbury Chocolate Experience NIA_02

8 September 2025

NVC

NOISE VIBRATION CONSULTING

Document Set ID: 3598180
Version: 1, Version Date: 25/03/2026

Executive Summary

Development of a visitor experience centre, 'Chocolate Experience at Cadbury', is proposed adjacent the existing Cadbury factory in Claremont. This report provides a Noise Impact Assessment against the Planning Scheme, intended to accompany the Development Application.

The proposed site is spread over two lots, comprising a large lot where the proposed experience centre is to be located, and a smaller lot comprising an existing carpark which is to be retained. Significant residential zoning surrounds the proposed site to the north and west of site, with additional residential zoning across Windermere Bay to the south.

The Tasmanian Planning Scheme and Glenorchy Local Provision Schedule contain criteria relevant to the proposed centre, with additional legislation and guidelines referenced to determine suitable numerical criteria.

Long-term noise measurements have been conducted at two locations surrounding site to quantify the existing acoustic environment in the area, with measured day time ambient noise levels of nominally 39 dBA and 42 dBA to the north and south of site respectively.

Software noise modelling has been carried out using iNoise software to predict noise levels across site and at surrounding sensitive receivers. Predictions included the proposed mechanical plant equipment, as well as key noise sources related to the proposed operations at the centre, including light vehicles and buses within the carpark.

Predicted noise levels at surrounding sensitive receivers showed that noise due to mechanical plant equipment satisfies the criteria for day and night time use without additional noise control. Additionally, noise due to mechanical plant equipment is predicted to be equal to the measured background (L90) noise level, and thus is expected to be on the threshold of audibility at location A during the day time. Noise from mechanical plant is expected to be entirely inaudible at location A during the night time and locations B and C during the day and night time periods, with noise levels predicted to be under the existing measured background noise level.

Additionally, trucks and buses are predicted to result in noise levels that satisfy the relevant criteria, however, are likely to be audible given the existing measured background noise levels. As such, it is recommended that the bus drop-off area is designed to ensure that buses do not operate within close proximity of the residential dwellings, as well as recommendations to reduce the duration for which buses are idling within the carpark, to minimise the likelihood of annoyance.

Noise emissions from the proposed visitor experience centre are predicted to result in no unreasonable loss of amenity for surrounding residential receivers, and thus the relevant clauses of the Tasmanian Planning Scheme and the Glenorchy Local Provisions Schedule are satisfied.

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Chocolate Experience at Cadbury
Noise Impact Assessment

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Document Control

Document Reference	Date	Author	Reviewed	Comments
25068 Cadbury Chocolate Experience NIA	15/07/25	J Parry	J Pitt	Issued
25068 Cadbury Chocolate Experience NIA_01	01/09/25	J Parry	J Pitt	Revised mechanical plant equipment
25068 Cadbury Chocolate Experience NIA_02	08/09/25	J Parry	-	Minor amendments

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1. BACKGROUND

Development of a visitor experience centre, 'Chocolate Experience at Cadbury', is proposed adjacent the existing Cadbury factory in Claremont. The proposal comprises a two-storey experience centre, an outdoor playground and cafe, and a jetty to provide access to site via ferry. Due to the location of the proposed development and its proximity to existing residential dwellings, a Noise Impact Assessment has been requested to accompany the Development Application. This report summarises the findings of such a Noise Impact Assessment, initially completed by NVC in July 2025, with this amended version issued in September 2025 to reflect the revised mechanical plant equipment.

1.1. Site and Surroundings

The proposed experience centre (the centre) is approximately shown by the yellow area in Figure 1.1, below, and is located adjacent the existing Cadbury Factory, off Cadbury Road, Claremont. The site is spread over two lots (see solid white outlines in Figure 1.1, below), a large lot located to the south of Cadbury Road where the proposed centre is to be located, and a smaller lot to the north of Cadbury Road comprising an existing carpark which is to be retained. The southern lot is primarily zoned General Industrial (purple overlay), with some Open Space and Environmental Management zoning on the southern and western portions of the lot. The northern lot where the carpark is located comprises primarily Light Industrial zoning (magenta overlay), with some Open Space zoning along the eastern and northern perimeters. The southern border of site is zoned Environmental Management.



FIGURE 1.1: SITE AND SURROUNDING AREA

To the north and north-west of site is significant General Residential zoning (red overlay), comprising dwellings on typical residential lots. Additionally, General Residential zoning is located to the south of site, across Windermere Bay, similarly comprising predominantly single residential dwellings.

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The topography of site features steep embankments down to the water, with the proposed location of the centre located nominally 15 m above sea level. As such, the centre has line of sight to the residential dwellings on Curlew Road, across Windermere Bay, and also features minimal topographical screening to the residents to the north of site.

Table 1.1, below, presents a summary of the nearest residential receivers, with each location representative of each of the nearest residential locations to the north, north-west and south of site. The distances listed denote the approximate distance between the centre and the sensitive receiver locations.

TABLE 1.1: SURROUNDING SENSITIVE RECEIVERS

Location	Address	Distance to Site	Description
A	2 Bournville Crescent	190 m	The nearest residential receiver. Note that this location is expected to be subject to some acoustic screening and existing noise due to the existing factory. Located immediately adjacent the existing carpark, and is located nominally 100 m from the existing Cadbury Factory.
B	101 Cadbury Road	260 m	A residential receiver to the north-west of site. This location has no structures in the intervening land that provide any meaningful acoustic screening of the centre. This location is located immediately adjacent the existing 'Cadbury Oval' sports ground, and thus will experience noise from existing events occurring at the oval.
C	27 Curlew Parade	470 m	A residential receiver across Windermere Bay to the south of site. This location is representative of the row of houses on this side of the bay and is located at nominally 5 m above sea level. This location has clear line of sight to the existing Cadbury Factory and the location of the proposed centre.

1.2. Proposed Development

The proposed experience centre is intended as an interactive and informative visitor centre, and includes a visitor experience 'chocolate central' area, a 'build your own block' facility, a 'tropical house' greenhouse, 'premium chocolate studio' and general chocolate production areas, as well as associated amenities and administrative areas. This is spread over a nominal 3-storey building, with each floor broadly comprising the following:

Ground Floor:

- Internal retail and experience centre.
- Internal and external cafe dining area.
- Chocolate production and storage areas.

Level 1:

- Administrative areas.
- Laboratory and greenhouse spaces.
- 'Premium Chocolate Studio' areas.

Level 2:

- Internal retail and experience centre.
- Internal and external cafe dining area.
- Chocolate production and storage areas.

In addition to the above, an external cafe and playground are located to the west of site.

The centre is proposed to be open every day except for Christmas Day, with opening hours of 9AM to 6PM. The site is expected to primarily be accessed via light vehicles and buses, all of which will utilise the existing carpark on the northern lot, with buses expected to access site between 8AM to 7PM. Additionally, commercial vehicles are proposed to access site for deliveries, with NVC informed that

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access to site will be via the service road and will occur within the acceptable hours as outlined under the Scheme (see Section 2, below).

Additionally, a new privately operated jetty and ferry service are proposed, providing access from the Hobart CBD to the centre via the Derwent River. The proposed jetty will be privately owned and operated, and used solely by the Cadbury ferry service, proposed to be a 30 to 35 m catamaran with a capacity of up to 240 passengers. The ferry's operation is proposed to coincide with the centre's opening hours, with all arrivals and departures occurring between 9AM and 6PM. As far as NVC is aware, the operation of the ferry itself is not part of this Development Application, and thus it's operation has not been included in this assessment.

Figure 1.2, below, provides a preliminary site plan, showing the proposed building foot print, as well as the location of the proposed jetty to the south-west of site.

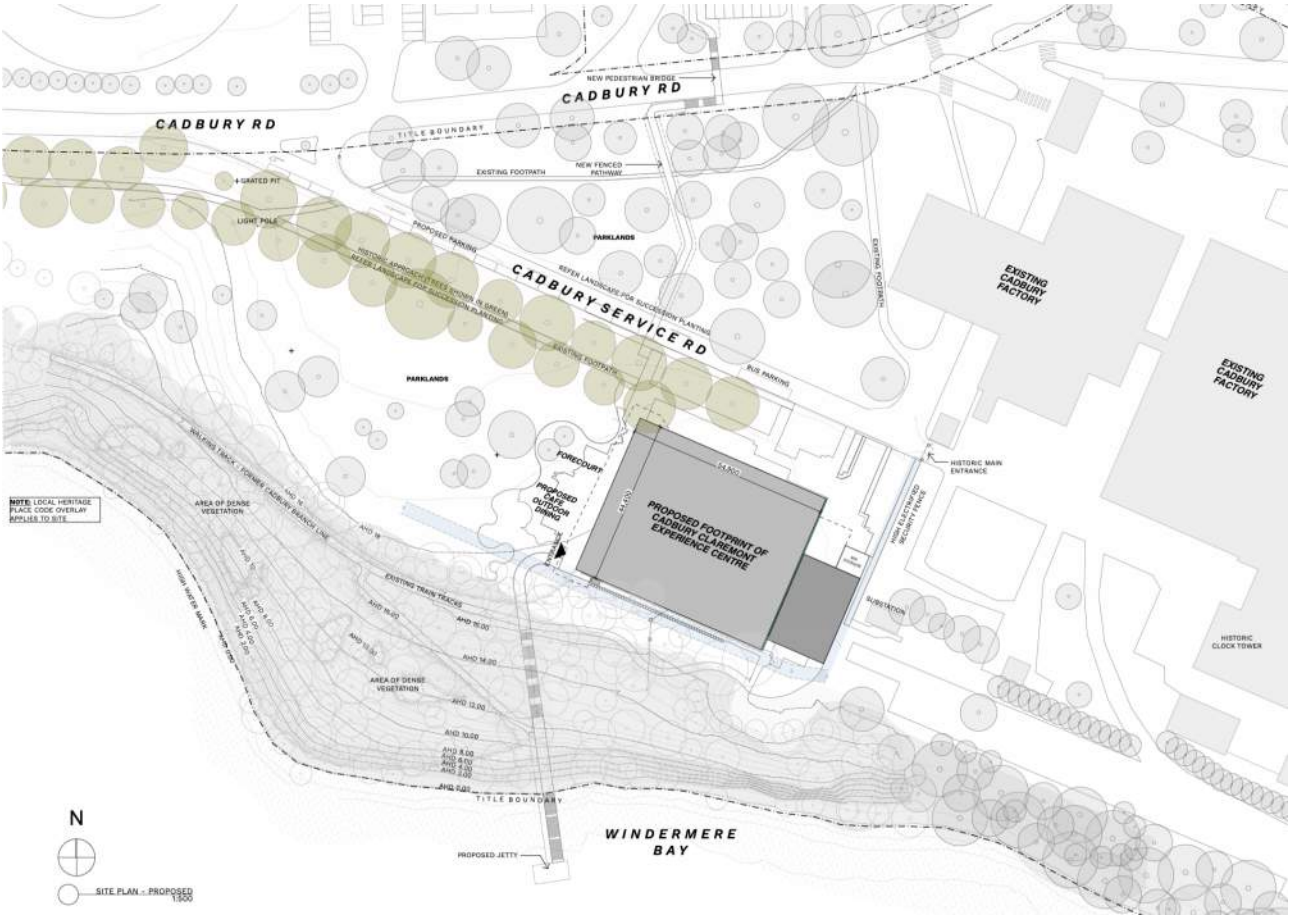


FIGURE 1.2: PROPOSED SITE LAYOUT

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2. CRITERIA

The development of the experience centre is proposed over two existing lots, both of which are split zoned. As such, multiple sections and clauses within the Tasmanian Planning Scheme and Glenorchy Local Provisions Schedule are considered relevant to the assessment. The relevant standards, guidelines and legislation are outlined below, with a summary of adopted project criteria provided in Section 2.1.

Tasmanian Planning Scheme

Sections 18 and 23 of the Tasmanian Planning Scheme contains criteria for Light Industrial and Environmental Management zones. In particular, clauses 18.3.1 and 23.3.1 detail criteria related to noise emissions for uses within Light Industrial and Environmental Management zones. The relevant parts of these clauses have been reproduced below:

18.3.1 All uses

Objective:	That uses do not cause an unreasonable loss of amenity to residential zones.
Acceptable Solutions	**Performance Criteria**
A1 Hours of operation of a use, excluding Emergency Services, Natural and Cultural Values Management, Passive Recreation or Utilities, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must be within the hours of: (a) 7.00am to 9.00pm Monday to Saturday; and (b) 8.00am to 9.00pm Sunday and public holidays.	**P1** Hours of operation of a use, excluding Emergency Services, Natural and Cultural Values Management, Passive Recreation or Utilities, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone, or Rural Living Zone, must not cause an unreasonable loss of amenity to the residential zones, having regard to: (a) the timing, duration or extent of vehicle movements; and (b) noise, lighting or other emissions.
A3 Commercial vehicle movements and the unloading and loading of commercial vehicles for a use, excluding Emergency Services, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must be within the hours of: (a) 7.00am to 9.00pm Monday to Saturday; and (b) 8.00am to 9.00pm Sunday and public holidays.	**P3** Commercial vehicle movements and the unloading and loading of commercial vehicles for a use, excluding Emergency Services, on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone, or Rural Living Zone, must not cause an unreasonable loss of amenity to the residential zones, having regard to: (a) the time and duration of commercial vehicle movements; (b) the number and frequency of commercial vehicle movements; (c) the size of commercial vehicles involved; (d) manoeuvring required by the commercial vehicles, including the amount of reversing and associated warning noise; (e) any noise mitigation measures between the vehicle movement areas and the residential area; and (f) potential conflicts with other traffic.

23.3.1 Discretionary Uses

Objective:	That uses listed as Discretionary recognise and reflect the relevant values of the reserved land.
Acceptable Solutions	**Performance Criteria**
A1 No Acceptable Solution.	**P1** A use listed as Discretionary must be consistent with the values of the land, having regard to: (a) the significance of the ecological, scientific, cultural or scenic values; (b) the protection, conservation, and management of the values; (c) the specific requirements of the use to operate; (d) the location, intensity and scale of the use; (e) the characteristics and type of the use; (f) traffic and parking generation; (g) any emissions and waste produced by the use; (h) the measures to minimise or mitigate impacts; (i) the storage and handling of goods, materials and waste; and (j) the proximity of any sensitive uses.

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Glenorchy Local Provisions Schedule

Section GLE-S15.0 of the Glenorchy Local Provisions Schedule contains the draft Cadbury Visitor Experience Specific Area Plan (SAP), certified on the 28th January 2025. Within this section, criteria for uses within the Cadbury Visitor Experience SAP are outlined. In particular, Clause GLE-S15.6.1 details criteria related to noise emissions for uses within the Cadbury Visitor Experience SAP. The relevant parts of this clause have been reproduced below:

GLE-S15.6.1 Tourist Operation impact

This sub-clause is in addition to the provisions of the General Industrial Zone – Clause 19.3 Use Standards.

Objective:	That Tourist Operation use: (a) does not cause an unreasonable loss of residential amenity to residential zones; and (b) does not compromise the industrial use of the site.
A1 Hours of operation of a Tourist Operation use on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must be within the hours of: (a) 7.00am to 9.00pm Monday to Saturday; and (b) 8.00am to 9.00pm Sunday and public holidays.	**P1** Hours of operation of a Tourist Operation use on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must not cause an unreasonable loss of amenity to the residential zone, having regard to: (a) the timing, duration or extent of vehicle movements; and (b) noise, lighting or other emissions.
A2 External lighting for a Tourist Operation use on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must: (a) not operate within the hours of 11.00pm to 6.00am, excluding any security lighting; and (b) if for security lighting, be baffled so that direct light does not extend into the adjoining property.	**P2** External lighting for a Tourist Operation use on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must not cause an unreasonable loss of amenity to the residential zone, having regard to: (a) the level of illumination and duration of lighting; and (b) the distance to habitable rooms of an adjacent dwelling.
A3 Commercial vehicle movements and the unloading and loading of commercial vehicles for a Tourist Operation use on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must be within the hours of: (a) 7.00am to 9.00pm Monday to Saturday; and (b) 8.00am to 9.00pm Sunday and public holidays.	**P3** Commercial vehicle movements and the unloading and loading of commercial vehicles for a Tourist Operation use on a site within 50m of a General Residential Zone, Inner Residential Zone, Low Density Residential Zone or Rural Living Zone, must not cause an unreasonable loss of amenity to the residential zone, having regard to: (a) the time and duration of commercial vehicle movements; (b) the number and frequency of commercial vehicle movements; (c) the size of commercial vehicles involved; (d) manoeuvring required by the commercial vehicles, including the amount of reversing and associated warning noise; (e) any noise mitigation measures between the vehicle movement areas and the adjoining residential area; and (f) potential conflicts with other traffic.

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In determining numerical noise levels that will not result in an unreasonable loss of amenity at surrounding residential dwellings, the guidelines and legislation deemed most relevant are referenced, with summaries of each presented below.

Tasmanian Environmental Protection Policy (Noise) 2009

The Tasmanian Environmental Protection Policy (Noise) 2009[1] (TAS Noise EPP) is considered to be the most appropriate guideline for general noise emissions from the proposed development. General noise emissions include noise resulting from light and heavy vehicles, patrons, and music. In *Table 1* of the TAS Noise EPP, a list of Acoustic Environmental Indicator levels is given for which the environmental values specified in the TAS Noise EPP "…*will be protected for the majority of the human population where the acoustic environment indicator levels are not exceeded…".* A section of that table is reproduced in Table 2.1, below.

TABLE 2.1: ACOUSTIC ENVIRONMENTAL INDICATOR LEVELS - TAS NOISE EPP

Specific Environment	Critical Health Effect	Leq dBA	Time hrs	Lmax dBA
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

It is noted that the TAS Noise EPP takes the day and night time periods to be 6AM to 10PM, and 10PM to 6AM respectively. NVC has been informed that all general operations are to occur during the day time period only, with some mechanical plant likely to operate during the night time.

Environmental Management and Pollution Control (Noise) Regulations 2016

The Environmental Management and Pollution Control (Noise) Regulations 2016[2] (TAS Noise Regulations) is the legislation most appropriate for noise emissions from fixed mechanical plant equipment, including air handling units, chillers, air conditioning equipment, etc. The TAS Noise Regulations detail the following criteria for the operation of fixed equipment, under Section 7.1:

"(1) *A person must not operate fixed equipment on any premises -*

a. from 7:00AM until 10:00PM, if the fixed equipment, when so operated, emits noise that is greater than 45 dBA; or

b. from 10:00PM until 7:00AM, if the fixed equipment, when so operated, emits noise that is greater than 40 dBA."

It is noted that the Noise Regulations criteria apply 1 m from the residential building facade, rather than at the boundary of the site or private outdoor space.

2.1. Adopted Project Criteria

Given the above, the following adopted project criteria are considered relevant to the project:

TABLE 2.2: ADOPTED PROJECT CRITERIA

	Criteria	Applicability
TAS Noise EPP	50 dBA, $Leq_{(16\text{-hour})}$	All noise sources — during day time period.
TAS Noise Regulations	40 dBA, SPL	Fixed mechanical plant — during night time only.
	45 dBA, SPL	Fixed mechanical plant — during day time only.

[1] *'Tasmanian Environmental Protection Policy (Noise) 2009'*, Department of Environment, Parks, Heritage and Arts, 2009

[2] *'Environmental Management and Pollution Control (Noise) Regulations 2016'*

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3. NOISE MEASUREMENTS

Unattended noise measurements were made on site between the 27th June and 3rd July 2025 to quantify the existing acoustic environment. Measurements used Svan Type 1 sound level meters, logging in A-weighted decibels with a *Fast* response time, with calibration checked before and after with a Larson Davis CAL200 acoustic calibrator. The data set comprised overall levels, one-third octave spectra and full statistical data at 10-minute intervals, with spectra and overall levels also recorded at 1-second intervals. The measurements were made at locations 1 and 2 (see Figure 3.1, below). Location 1 was chosen as being representative of the existing noise levels at the row of dwellings adjacent the carpark and the dwellings to the west of 'Cadbury Oval', with location 2 representative of noise levels at the nearest receivers across Windermere Bay.



FIGURE 3.1: MEASUREMENT LOCATIONS

The statistical noise levels across the measurement period are summarised in Table 3.1, below.

TABLE 3.1: SUMMARY OF MEASURED NOISE LEVELS

Time Period	Sound Pressure Level (dBA)					
	Location 1			Location 2		
	L10	L90	LEQ	L10	L90	LEQ
Day Time (6AM to 10PM)	45	39	45	47	42	47
Night Time (10PM to 6AM)	38	32	36	42	39	41

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Figures 3.2 and 3.3, below, present the measured noise trend and spectrogram at the two unattended noise monitoring locations.

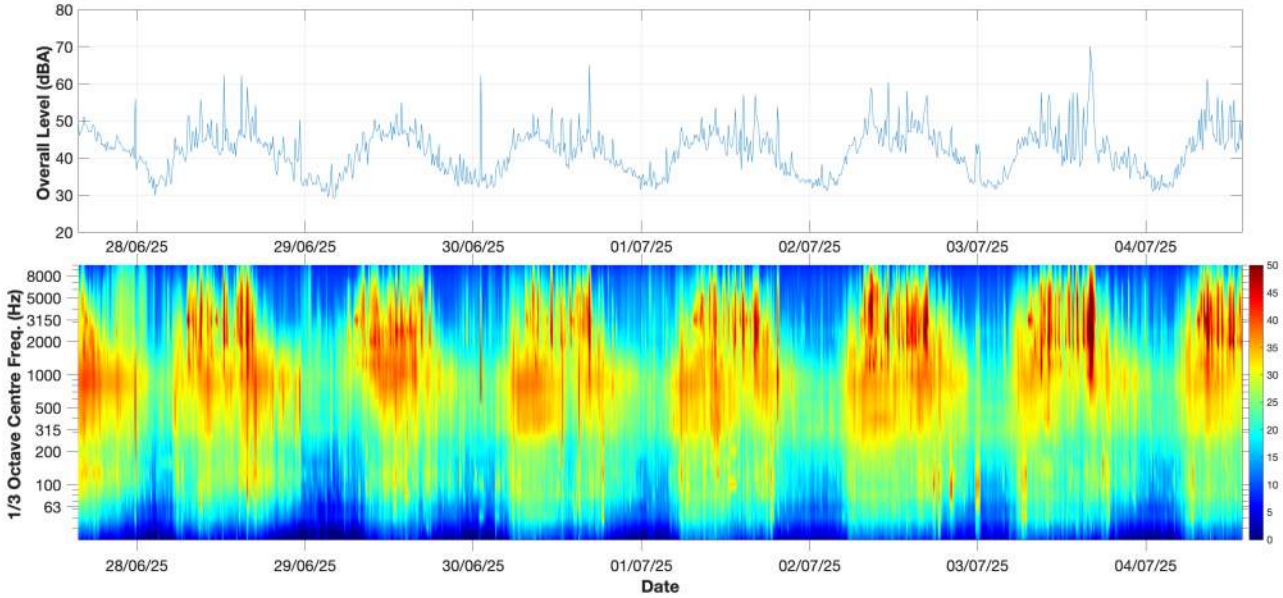


FIGURE 3.2: MEASURED NOISE TREND AND SPECTROGRAM - LOCATION 1

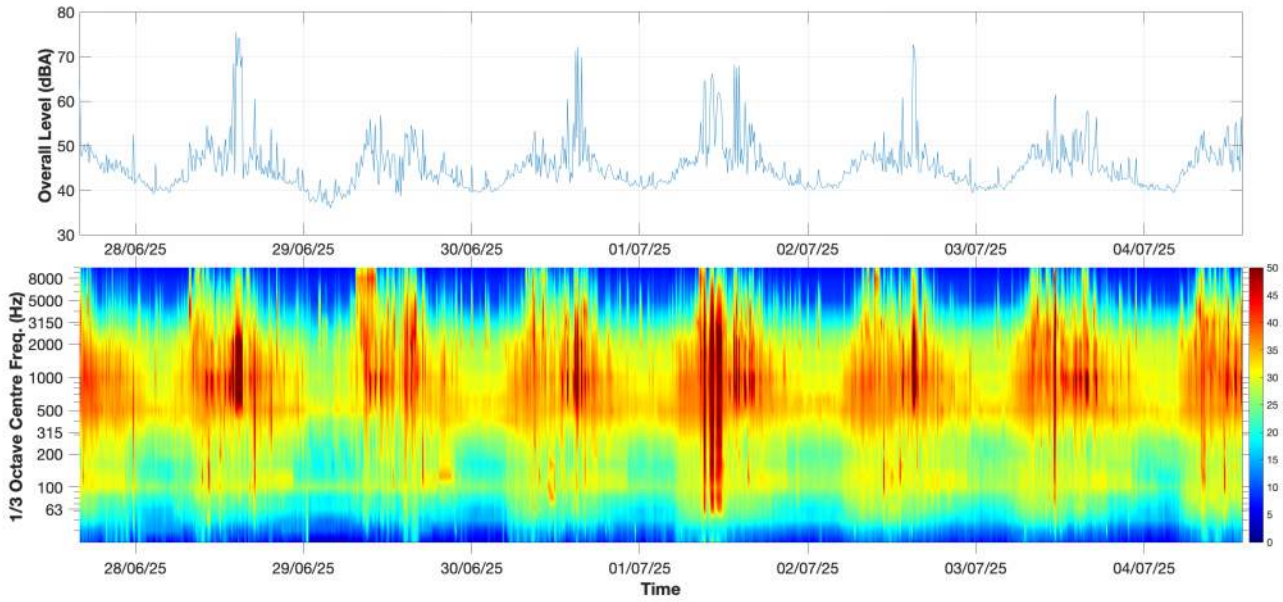


FIGURE 3.3: MEASURED NOISE TREND AND SPECTROGRAM - LOCATION 2

Based on the observations conducted whilst on site and results of the noise measurements, the following key points are relevant to the assessment:

Location 1:

- Whilst on-site, noise emissions from the existing Cadbury factory were inaudible.
    - It is noted that location 1 was significantly screened from the factory by the multiple dwellings and fences in the intervening land.
- During discussion with residents at location 1, the resident noted that noise from light and heavy vehicles in the existing carpark to the west was intermittently clearly audible at all hours of the day and night time periods.
- It is noted that whilst on site noise from dogs barking in the general area was audible, as was noise due to birds and insects.

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Location 2:

- Whilst on-site, noise emissions from the existing Cadbury factory were clearly audible as broad-band noise, perceived to be due to fixed mechanical plant equipment. This noise controlled the background and is clearly visible in the measured noise spectrogram shown in Figure 3.3, above, by the consistent noise primarily centred around the 100 Hz, 500 Hz, and 1,000 Hz one-third octave centre frequency bands.
- It is noted that there is clear line of sight from location 2, across Windermere Bay, to the existing Cadbury factory.
- During discussion with the resident at location 2, they noted that heavy vehicles at the factory were often clearly audible at location 2, primarily perceived to be due to reverse beacons and low-frequency engine noise.
- It is noted that dogs barking in the general area were frequently audible.
- Traffic noise perceived to be from the Brooker Highway, located nominally 1 km to the west of site, was just audible as broad-band noise, typical of distant high-speed tyre noise.

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4. NOISE MODELLING

Predictions of the noise levels within the community resulting from the proposed experience centre and associated activities have been carried out using *iNoise*[3] software, which implements the ISO 9613[4] algorithms for environmental noise. The predictions account for geometric divergence, barrier attenuation, atmospheric absorption, reflections and screening from buildings, and ground absorption. Two scenarios have been modelled, representative of mechanical plant equipment on site, and general day-to-day operations, with sections 4.1 and 4.2, below, summarising the modelling methodology and results for each scenario respectively. The following key considerations are relevant to both noise models:

- 2 m topographical contours (from LiDAR data) have been used for the site and surrounding area.
- The ground has been assumed to have a ground factor of 0.3 (70% reflective) over the majority of the model, with the carpark and water assumed to have a ground factor of 0.0 (100% reflective).
- The building façades and barrier construction are modelled with a reflection factor of 0.8 (80% reflective).
    - Modelling of the drive-through driveway on the western side of the factory has been modelled to be a nominal 3 m gap beneath the building. Inclusion of this significantly reduces the screening between the chillers and location A.
- No residential fences have been included in the software noise models. Residential fences will provide further attenuation of site noise emissions, and so predicted noise levels are conservative.
- As per the Tasmanian Noise Measurement Procedures Manual[5], noise levels across the site are predicted at 1.2 m above ground level.
- The proposed parapet has been modelled around the entire roof's perimeter and extends 1 m above the roof of the building.

[3] iNoise V2024.1 Pro, DGMR Software

[4] *'Acoustics - Attenuation of sound during propagation outdoors'*, International Organization for Standardization, 2024

[5] *'Noise Measurement Procedures Manual'*, 2nd Ed., Department of Environment, Parks, Heritage and Arts, 2008

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4.1. Mechanical Plant

4.1.1. Modelling Methodology

The following section summarises the methodology by which the modelling of noise emissions from mechanical plant equipment have been carried out. The following key considerations are relevant to noise modelling of mechanical plant equipment:

- All mechanical plant source sound data and locations have been taken from indicative information provided by Collective Engineering[6].
  - The type and locations of exhaust fans have been based on NVC's previous experience with similar projects.
- All mechanical plant equipment is assumed to be operating continuously and simultaneously.
  - NVC has been informed that VRF condenser units will operate during the day time and night time periods to pre-condition spaces and maintain temperature within cool rooms and freezer rooms. All other mechanical plant will be restricted to the day time period only.
- No noise control (acoustic barriers, silencers, etc.) has been included in the noise modelling presented within this section, and thus predicted noise levels are worst-case.
- All mechanical plant equipment except for the chillers have been assumed to be on a rooftop plant deck, and thus the 'modelled height' noted in Table 4.1 is the modelled height above the roof.
  - The chillers have been modelled within a ground floor plant area to the east of the centre, and thus the 'modelled height' for these units is representative of the height above ground level.

Table 4.1, below, summarises the type, sound power level, quantities, and modelled heights of the modelled mechanical plant equipment.

TABLE 4.1: SUMMARY OF MODELLED NOISE SOURCES - MECHANICAL PLANT

Source	Description	Qty.	SWL (dBA)	Modelled Height Above Roof
AHU (Type A)	AHU with nominally 1,800 L/s flow rate.	3	78	1 m
AHU (Type B)	AHU with nominally 2,400 L/s flow rate.	3	81	1 m
AHU (Type C)	AHU with nominally 3,600 L/s flow rate.	2	78	1 m
AHU (Type D)	AHU with nominally 5,500 L/s flow rate.	1	77	1 m
AHU (Type E)	AHU with nominally 7,200 L/s flow rate.	2	80	1 m
Chillers	Air-cooled chiller with nominal 1,250 kW cooling capacity (e.g. HiRef TVA-1351C)	2	92	1 m *
Exhaust Fans	Nominally 400 mm diameter vertical discharge fan (e.g. Fantech CE404V)	6	75	0.5 m
50 kW VRF Units	50 kW VRF condenser unit (e.g. Mitsubishi REYQ16BYM9)	3	83	0.5 m
56 kW VRF Units	56 kW VRF condenser unit (e.g. Mitsubishi PURY-P450YNW-A1(-BS))	2	89	0.5 m

* Modelled height above ground level

[6] Via email, Collective Engineering, 06/08/25

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Figure 4.1, below, presents the modelled locations of the noise sources. As noted above, no acoustic screening, enclosures or silencers have been included in the noise modelling.



FIGURE 4.1: LOCATIONS OF MODELLED NOISE SOURCES - MECHANICAL PLANT

4.1.2. Results

Following the modelling of the proposed mechanical plant equipment, as described in Section 4.1.1, above, the resultant predicted noise levels at the surrounding sensitive receivers are summarised in Table 4.2, below.

TABLE 4.2: SUMMARY OF NOISE PREDICTIONS - MECHANICAL PLANT

Source	Predicted Sound Pressure Level (dBA)		
	Location A	Location B	Location C
AHUs	30	26	20
Chillers	38	< 20	30
Exhaust Fans	21	< 20	< 20
VRF units	30	30	24
TOTAL	**39**	**32**	**31**

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Figures 4.2 and 4.3, below, presents the predictive noise contours across site and the surrounding area as a result of noise emissions from the proposed mechanical plant equipment during the day and night time periods respectively.



FIGURE 4.2: PREDICTIVE NOISE CONTOURS - MECHANICAL PLANT (DAY)



FIGURE 4.3: PREDICTIVE NOISE CONTOURS - MECHANICAL PLANT (NIGHT)

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4.1.3. Discussion

The below points summarise the key findings of the software noise modelling of noise emissions from the proposed mechanical plant equipment:

Location A:

- Noise levels at location A are predicted to satisfy the day and night time criteria for mechanical plant equipment, as shown in Table 4.2, above.
    - The proposed night time mechanical plant equipment (VRF units) are predicted to comfortably satisfy the night time criterion, with noise levels predicted to reach nominally 30 dBA at location A.
- Noise levels from all mechanical plant equipment are predicted to be below the existing measured background (L90) noise level at location A during the day and night time periods respectively. As such, noise from mechanical plant equipment is not expected to be audible at location A.

Location B:

- Noise levels at location B comfortably satisfy the day and night time noise criteria for fixed mechanical plant equipment.
- Predicted noise levels due to mechanical plant equipment are below the measured background (L90) noise level during the day and night, and thus noise due to mechanical plant equipment is expected to be entirely inaudible at all times.

Location C:

- Noise levels at location C are predicted to comfortably satisfy the day and night time noise criteria for fixed mechanical plant equipment.
- Noise levels due to mechanical plant equipment are predicted to be below the measured background noise level by more than 10 dB during the day and night time periods. As such, mechanical plant equipment is expected to be entirely inaudible during the day time.

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4.2. General Operations

4.2.1. Modelling Methodology

The following section summarises the methodology by which the noise modelling of general operations has been carried out. The following key considerations are relevant to the noise modelling:

- General operations include all mechanical plant noise sources, as described in Section 4.1, above, as well as general day-to-day on-site operations.
- NVC has been informed that nominally 2,350 patrons are expected to visit site on a typical day.
    - The number of light vehicles accessing site has been assumed to be 1,200 per day and has been taken from information provided by MCG Consult[7]. A single worst-case 1-hour period has been modelled, assuming all light vehicles arrive within the busiest 4-hour period (11AM to 3PM), resulting in nominally 300 light vehicles arriving in a 1-hour period.
        - Vehicle sound power level data has been taken from NVC's library of previously measured data of a typical light vehicle manoeuvring at low speeds and idling, as well as a semi-trailer and public bus idling and moving away from a stand still.
    - Similar to above, it has been assumed that all buses and trucks will access site within the same busiest 4-hour window, and thus three buses and two trucks have been modelled to access site within a 1-hour period.
    - For the ferry, a worst-case peak-hour period has been modelled, assuming nominally 240 patrons arriving within a 1-hour period, representative of a ferry at maximum capacity.
- The sound power level of kids playing in the playground has been taken from the AAAC's Guideline for Child Care Centre Acoustic Assessment[8].
    - Kids playing in the playground have been modelled as two groups of 3 to 5 year old children, with each group comprising ten children playing.
- The sound power level of patrons moving between the centre and the ferry, as well as within the outdoor cafe area has been taken from the AAAC's Licensed Premises Noise Assessment Technical Guideline[9].
    - Patrons within the outdoor cafe area are representative of 10 people speaking continuously and simultaneously at a 'normal' level, typical of a cafe setting. This is representative of a total of 30 patrons with a speaking group of three (i.e. one in three people are talking simultaneously).
    - Patrons moving between the ferry and the centre have been modelled as all people speaking continuously and simultaneously at a 'normal' level, typical of a conversational level.
- Only noise emissions due to noise sources on the subject site have been included. As such noise due to the ferry's engines has not been included in the noise modelling.

[7] Email: Cadbury Experience Centre TIA, MCG Consult, received by NVC on 03/07/25.

[8] *'Licensed Premises Noise Assessment Technical Guideline'*, Ver. 2.0, Association of Australasian Acoustical Consultants, 2020

[9] *'Guideline for Child Care Centre Acoustic Assessment'*, Ver. 3.0, Association of Australasian Acoustical Consultants, 2020

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Table 4.3, below, summarises the sound power levels, quantities, and modelled heights above ground level of the modelled noise sources, with Figure 4.4 presenting their modelled locations. Note that to ensure clarity, the modelled locations of mechanical plant equipment are not included in Figure 4.4. Figure 4.1 is to be referred to for the modelled locations of mechanical plant equipment.

TABLE 4.3: SUMMARY OF MODELLED NOISE SOURCES - GENERAL OPERATIONS

Source	Description	Qty.	SWL (dBA)	Modelled Height Above Ground
Mechanical Plant	See Section 4.1, above			
Car (Manoeuvring)	Typical of a light vehicle during low-speed manoeuvring.	300 / hour	74	0.5 m
Car (Idling)	Car idling near the eastern boundary of the carpark.	1	71	0.5 m
Buses (Manoeuvring)	Buses travelling to the carpark.	3 / hour	97	0.75 m
Buses (Idling)	Bus idling within the carpark, typical of a bus waiting for passengers to board.	1	91	0.75 m
Trucks (Manoeuvring)	Trucks for deliveries to and from the centre.	2 / hour	101	0.75 m
Trucks (Idling)	Truck idling at the end of the service road, typical of a truck delivering product.	1	97	0.75 m
Kids in Playground	Group of ten 3 - 5 year olds playing.	2 groups	87	1.5 m
Patrons From Ferry	Adults continuously speaking at a ‘normal’ level.	240 / hour	69	1.5 m
Patrons in Cafe	Total of 30 patrons with one in three adults continuously speaking at a ‘normal’ level.	10	69	1.5 m

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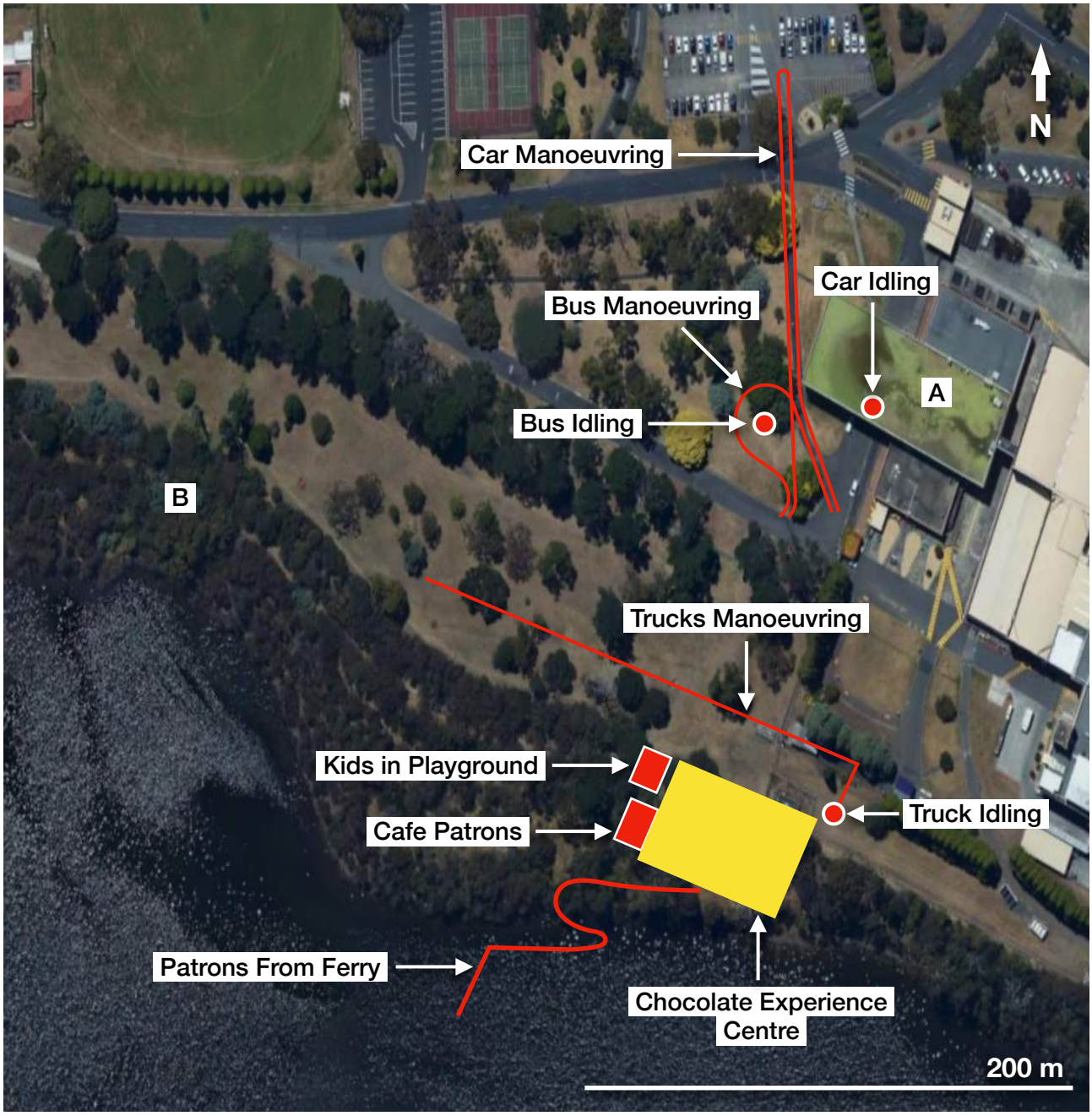


FIGURE 4.4: LOCATIONS OF MODELLED NOISE SOURCES - GENERAL OPERATIONS

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4.2.2. Results

Following the modelling of the proposed on-site operations, as described in Section 4.2.1, above, the resultant predicted noise levels at the surrounding sensitive receivers are summarised in Table 4.4, below.

TABLE 4.4: SUMMARY OF NOISE PREDICTIONS - GENERAL OPERATIONS

Source	Predicted Sound Pressure Level (dBA)		
	Location A	Location B	Location C
Mechanical Plant	39	32	31
Cars	39	27	< 20
Buses	46	35	21
Trucks	43	39	26
Kids in Playground	35	35	26
Patrons From Ferry	< 20	< 20	< 20
Patrons in Cafe	20	24	< 20
TOTAL (NO Mechanical Plant)	**48**	**42**	**30**
TOTAL (WITH Mechanical Plant)	**48**	**42**	**33**

Figures 4.5 and 4.6, below, present the predictive noise contours across site and the surrounding area as a result of noise emissions from the centre, with and without mechanical plant equipment respectively. Note that predictions of noise emissions with mechanical plant *do not* include any noise control in the form of acoustic barriers.

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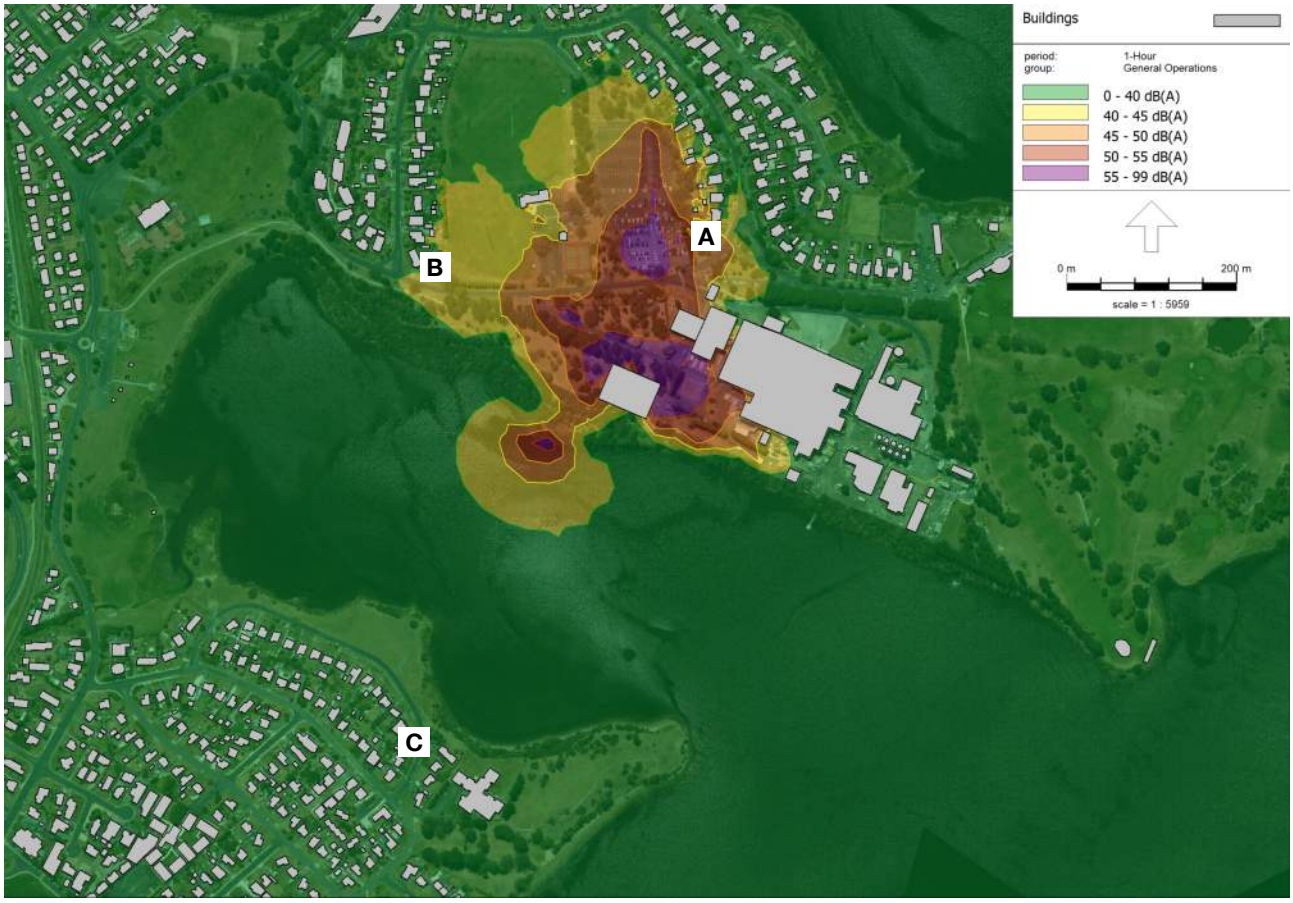


FIGURE 4.5: PREDICTIVE NOISE CONTOURS - GENERAL OPERATIONS (NO MECHANICAL PLANT)

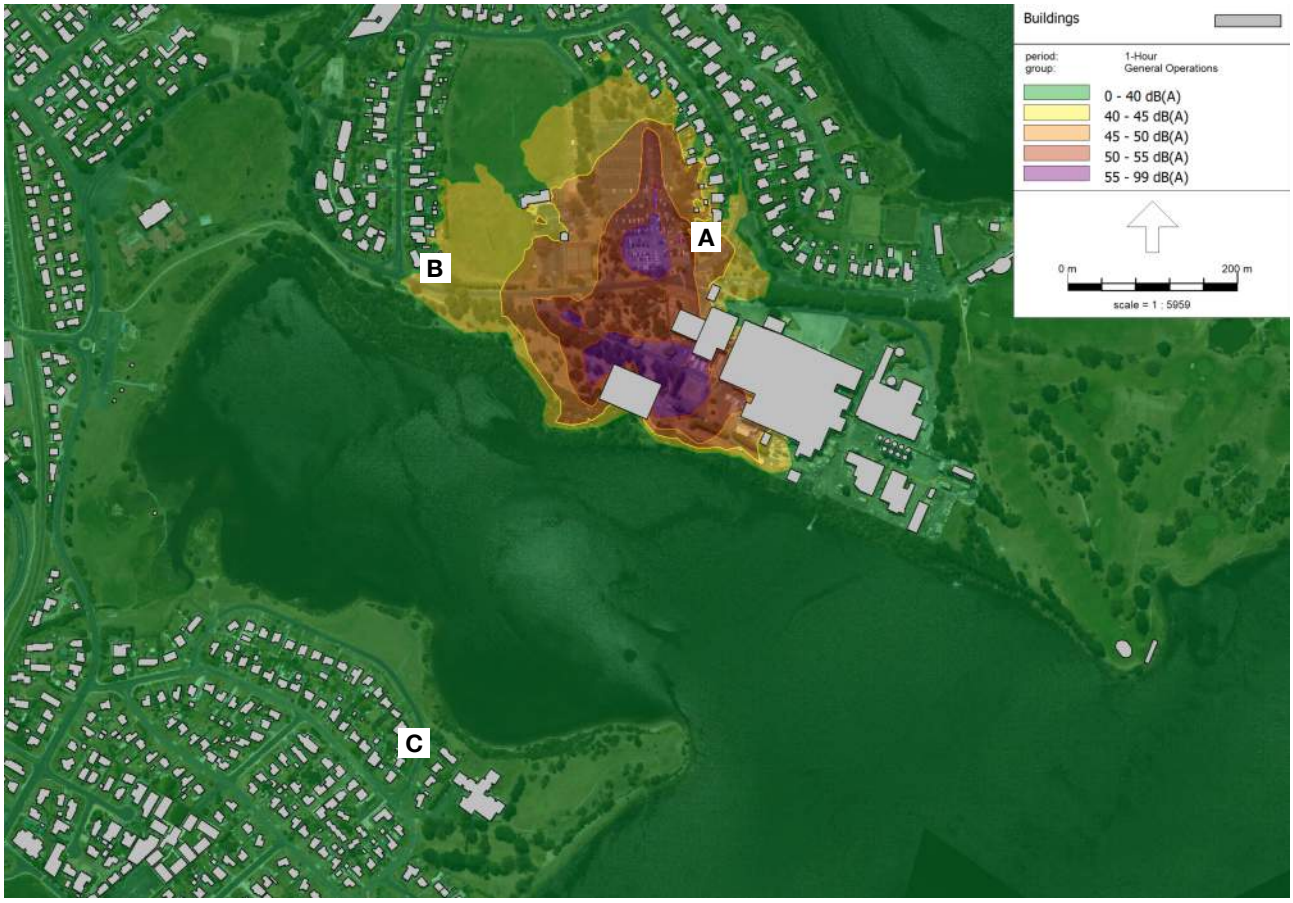


FIGURE 4.6: PREDICTIVE NOISE CONTOURS - GENERAL OPERATIONS (WITH MECHANICAL PLANT)

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4.2.3. Discussion

The below points summarise the key findings of the software noise modelling of the proposed general operations:

Location A:

- Out of the three identified receiver locations, location A is predicted to be the worst-affected in scenarios including and excluding mechanical plant equipment.
- The overall predicted noise level due to all noise sources on site (including mechanical plant equipment) satisfies the 50 dBA day time criterion at all locations.
    - Noise at the worst-affected location (location A) is primarily controlled by noise from buses within the carpark. This noise is likely to be consistently audible and is primarily a result of stationary buses idling in the carpark.
        - It is noted that the measurement location to the north of site (location 1) was significantly screened from the existing Cadbury factory. As such, measured noise levels at location 1 are likely to be significantly lower than at location A, as location A is significantly exposed to noise emissions from the factory. Therefore, in reality, noise from buses and on-site activities is likely to be significantly less intrusive due to the existing acoustic environment.
    - Analysis of bus pass-by noise shows that an Lmax (maximum instantaneous noise level) of 52 dBA is predicted at location A when a bus passes by. This is below the TAS Noise EPP environmental acoustic indicator for 'serious annoyance' for a continuous noise, and is thus not expected to cause annoyance.

Location B:

- Noise levels at location B satisfy the day time noise criterion for general operations with and without mechanical plant equipment.
- Noise levels exceed the existing background by nominally 3 dB and is primarily controlled by trucks on the access road. At this level, noise from site operations is unlikely to be clearly audible for the majority of the time.

Location C:

- Similar to location B, above, noise levels at location C satisfy the day time noise criterion for general operations with and without mechanical plant equipment.
- Noise levels are predicted to be below the existing measured day time background noise level, and thus it is expected that noise from site is entirely inaudible during the day time.

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5. RECOMMENDATIONS

Following the software noise modelling of the proposed mechanical plant equipment and operations on site, recommended mitigation strategies are summarised below:

- Ensure all mechanical plant other than the VRF units are on automated timers, and thus cannot be inadvertently operated during the night time period (7AM to 10PM).
    - Modelling shows that the VRF units are not expected to be audible during the night, and thus their use during the night time is acceptable.
- In order to ensure the operational noise emissions from the proposed uses on site are controlled, it is recommended that the design of the carpark and bus drop-off area prevents buses stopping or idling within 38 m of the adjoining residential zone.
    - Figure 5.1, below, shows the approximate extents of the recommended bus exclusion area.



FIGURE 5.1: APPROXIMATE EXTENTS OF BUS EXCLUSION AREA

- It is recommended that buses are discouraged from idling within the carpark as much as is feasible.
    - Note that noise from buses typically comprise significant low-frequency noise. Low-frequency noise is less effectively attenuated by screening or air absorption, and thus it should be reduced as much as is feasible.
- Restrict heavy vehicle access to site and the carpark to during the day time period only (6AM to 10PM) where feasible to minimise the likelihood of disruption to surrounding sensitive receivers.

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6. DISCUSSION

Noise emissions from the proposed visitor experience centre, 'Chocolate Experience at Cadbury', have been modelled to determine the likely impact on surrounding sensitive receivers. The predicted noise levels show the following key findings:

- All predicted noise levels are worst-case, assuming a peak 1-hour period for light vehicles, buses, heavy vehicles, and patrons arriving via ferry. The 50 dBA criterion outlined within the TAS Noise EPP uses the $L_{eq(16\text{-hour})}$ metric, and thus, noise levels over the entire day time period will be significantly lower when expressed as an $L_{eq(16\text{-hour})}$. Therefore, the predicted levels presented within this report are representative of absolute worst-case, and in reality, noise levels will generally be lower.
- Noise from mechanical plant equipment is predicted to satisfy the associated 45 and 40 dBA criteria during the day and night time periods respectively.
    - During the day time, noise levels are predicted to be on the threshold of audibility at location A, and entirely inaudible at locations B and C.
    - Noise from the night time mechanical plant equipment (VRF units) are predicted to be inaudible during the night time period.
- Noise emissions from buses in the carpark are the primary source of noise at location A and surrounding dwellings. As discussed in Section 5, above, it is recommended that the design of the carpark and bus drop-off area prevents buses stopping or idling within 38 m of the adjoining residential zone.
    - Where feasible, it is recommended that bus drivers are discouraged from keeping vehicles idling whilst within the carpark.
- Noise due to patrons on site is not expected to be audible at any of the surrounding sensitive receivers.
    - It has been determined that noise due to internal patrons and music within the centre is not expected to result in any meaningful impact on the surrounding sensitive receivers.
- The overall noise from site is expected to be audible at location A, and inaudible at locations B and C.
    - Noise levels are predicted to be under the 50 dBA criterion outlined by the TAS Noise EPP at all identified receiver locations.

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7. ASSESSMENT

Noise emissions from operations and equipment related to the proposed visitor experience centre, 'Chocolate Experience at Cadbury', located in Claremont are not expected to result in an unreasonable loss of residential amenity. As such, the following is relevant to the assessment:

Clause 18.3.1 (TPS): No unreasonable loss of amenity is expected to occur at the surrounding residential zones and all commercial vehicle movements are to be within the Scheme acceptable hours, and thus Performance Criteria P1 and Acceptable Solutions A3 are satisfied.

Clause 23.3.1 (TPS): The intensity and scale of the use, traffic and parking generation, noise emissions from the use, and the proximity of surrounding sensitive uses have been considered, and noise emissions from site have been deemed to be consistent with the value of the land.

Clause GLE-S15.6.1 (GLPS): No unreasonable loss of amenity is expected to occur at the surrounding residential zones, and thus Performance Criteria P1 and Acceptable Solutions A3 are satisfied.

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Appendix A - Acoustic Glossary

Ambient Noise	All noise associated with a measurement, and typically ignoring the particular noise under investigation. Typically measured as Leq and will usually comprise noise from many sources.
Background Noise	Background noise describes the underlying level of noise present in the ambient noise. It may be described as the average of the minimum noise levels measured, and is typically measured by the statistical L90 level.
Decibel [dB]	The scale used for describing sound. It is a logarithmic scale that uses a reference sound pressure of 20 μPa, or reference sound power of 10^{-12} W.
d*BA*	A-weighted decibel. The human ear does not perform linearly and is better at hearing high frequency rather than low frequency sounds, ie. low frequency sound at the same dB level as a high frequency sound will be perceived as quieter. To replicate the human ear response a frequency weighting, denoted as an A-weighting, is applied to the sound. A sound measured in this way is then an A-weighted sound pressure level with units dBA. Practically all noise is measured using the A-weighting.
Leq	Energy averaged sound pressure level over a period of time, usually 10 to 15 minutes. Units of decibels, typically A weighted (LAeq). Because the decibel scale is a logarithmic ratio, the higher noise levels have far more sound energy, and therefore the Leq level tends to indicate an average which is strongly influenced by short-term, high level noise events. Many studies show that human reaction to level-varying sounds tends to relate closer to the LAeq noise level than any other descriptor.
Frequency	Frequency is synonymous with pitch and has the units of Hertz (Hz) or cycles per second. A bass drum produces a low frequency sound, and a small bell a high frequency sound. The frequency range for human hearing is approximately 30 Hz to 16 kHz.
L10, L90…	Lnn is the sound pressure level that is exceeded for nn% of the time. Hence the L10 describes the noisier events during the interval, and L90 the quieter events. The L90 is often used to describe the background level. A significant variation between the L10 and L90 would indicate an environment where there is a strong variation in noise levels, and the background is not the dominant source. As the variation between the L10 and L90 decreases, the background becomes more dominant.
Lmax	The instantaneous maximum level using the time response and frequency weighting set for the meter (typically Fast response, A weighted).
Inversion	A condition typically occurring on clear, still nights which is characterised by the air near the ground being colder than air at higher altitudes. The increasing speed of sound with altitude bends the sound back towards the ground causing a focussing of the sound in a small area. The inversion effect can cause increases in noise levels of 5 to 10 dB with greater increases in exceptional circumstances.

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