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Dear Ms Knight

**Reserve Activity Assessment #3602 Inveresk Pedestrian Bridge:
 Step 7 Approval – External Assessment**

The attached RAA #3602 Inveresk Pedestrian Bridge, with accompanying Appendices, fulfils the requirements for a Level 3 RAA form.

The activity outlined in RAA #3602 Inveresk Pedestrian Bridge requires external assessment, namely a planning permit from the City of Launceston (CoL). At this point the assessment from a PWS perspective is complete and PWS is signalling it plans to approve the RAA subject to any further conditions that are imposed by external assessment.

The approval of this RAA is included below.

Activity Authorised for External Assessment with the following conditions

Condition Title	Condition details
Commitments	Commitments as stated in section 8 of this RAA #3602
Lease from the Crown	UTAS/CoL to have an executed lease agreement with PWS in place prior to construction commencing.

Any Further Comment:

Authorised for External Assessment by:

Signed:

Date: 25/7/19

Name: Donna Stanley

Position: A/Regional Manager North

If you require further information, please contact Sonia Mellor, Regional Planner North, , Parks and Wildlife Service, by telephone on 0436 636 279 or by email to sonia.mellor@parks.tas.gov.au.

Yours sincerely



Donna Stanley
A/Regional Manager North

25 July 2019

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Level 3 Reserve Activity Assessment

Construction of Inveresk Pedestrian
Bridge

Prepared for
University of Tasmania

Client representative
Sam Tucker

Date
27 June 2019

Rev 00



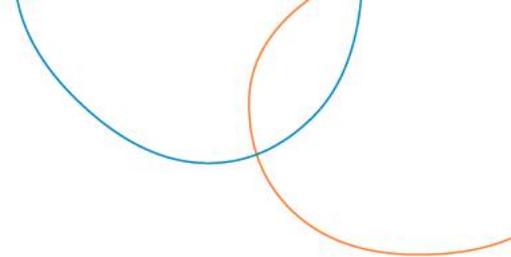


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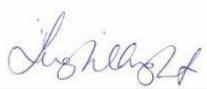
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Appendices

- Appendix A** — Plans of the proposed bridge
- Appendix B** — Ecological assessment
- Appendix C** — Environmental Site Assessment
- Appendix D** — Construction Environmental Management Plan
- Appendix E** — Aboriginal Heritage Tasmania Search Results

Prepared by — L Knight		Date — 27 June 2019
Reviewed by — D Lenel		Date — 27 June 2019
Authorised by — B Hart		Date — 27 June 2019

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
00	Final for Lodgement	L Knight	D Lenel	B Hart	27/06/2019

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Executive Summary

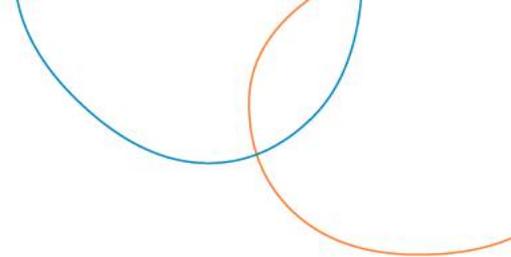
As part of the University of Tasmania (UTAS) Northern Transformation Program, university functions from the Newnham campus will be relocated to Inveresk and land on the corner of Boland and Willis St, Launceston. As part of the development of these sites, the construction of a pedestrian and cyclist bridge over the North Esk River is proposed to connect the new facilities. This bridge will extend from the levee near the Inveresk student accommodation building to Boland St, near the intersection with Willis St. The bridge will be constructed by UTAS and will become a City of Launceston asset.

The North Esk River (below mean high water mark) is Crown land managed by the Tasmanian Parks and Wildlife Service (PWS) and falls within the Tamar Conservation Area. This Reserve Activity Assessment (RAA) has been prepared for those elements of the bridge within the river and requiring consent from PWS.

The proposed bridge has limited potential to impact on the natural values of the North Esk River. Habitats within the river are highly disturbed and impacted by weeds, siltation and poor water quality. Potential risks related to previous land uses on either side of the river and acid sulphate soils were also identified.

A range of avoidance and mitigation measures have been recommended to minimise the potential for impacts on the existing environments resulting from the proposed works.

- Pile driving within the river will displace a limited volume of silt. However, this will be a short term impact and when related to existing conditions, the impact is not considered unacceptable.
- Other measures include weed hygiene protocols and appropriate sediment disturbance controls to minimise the potential for the escape of sediment to the river.
- There will be no obstruction of fish passage as a result of bridge construction.
- The ability of the community to enjoy the North Esk River will not be significantly reduced by the proposed bridge. There are significant community benefits associated with the construction of a purpose built crossing at this locality, which will serve the wider community as well as students and faculty of the university in the future.



1. Introduction

1.1 Project overview

The construction of a pedestrian and cyclist bridge is proposed over the North Esk River to connect current UTAS facilities at Inveresk and planned facilities on Willis St, Launceston. This bridge will extend from the viewing platform on the levee at Inveresk, across the river to a location south of the levee, opposite the Boland St frontage of the Willis St site. Plans of the proposed bridge are provided in Appendix A.

The North Esk River is part of the Tamar Conservation Area – Conservation Area under the *Nature Conservation Act 2002*. Two piers required to support the bridge will be located within the river channel and on the river bank and require the approval of PWS as the authority responsible for the land.

1.2 Project objectives and outcomes

The proposed bridge will provide safe and convenient pedestrian and cyclist access across the North Esk River. There is currently access across Victoria bridge (210 m downstream) and another approximately 190 m upstream of the proposed bridge location. The proposed bridge will ultimately link university facilities on either side of the river and although there is currently no development on the UTAS site on Willis St, the bridge has been designed to provide a future connection to future development via a further section across Boland St.

The bridge will accommodate the large crowds that cross the river during large sporting and other events held at Inveresk and UTAS Stadium. It will also provide an alternative pathway from Inveresk and the student accommodation to facilities such as the aquatic centre, city park and sport and recreational areas off Racecourse Crescent.

1.3 Proponent details

1.3.1 Proponent details:

Name of proponent (legal entity)	University of Tasmania
Name of proponent (trading name)	University of Tasmania
Registered address of proponent.	Inveresk Railyards, 2 Invermay Road, Launceston
Postal address of proponent	Private Bag 94 Launceston, TAS 7000
ABN number	30 764 374 782

1.3.2 Contact person's details:

Name	Sam Tucker, Project Director Construction Inveresk Campus Development
Telephone	0429 025 518
Email address	SJ.Tucker@utas.edu.au

There is no operator for this activity.

1.3.3 Proponent Background

The University of Tasmania is a public research university founded in 1890 and has developed educational facilities across Tasmania, including the Tasmanian College of the Arts and the School of Architecture & Design located on the Inveresk site. Consolidation of UTAS' Launceston campuses at Inveresk will contribute to the Launceston renewal project. UTAS is ranked in the top 300 universities in the world under the Academic Rankings of World Universities.

1.4 Alternatives

Pedestrian access to Inveresk is currently directed over Victoria Bridge which is an older asset incorporating pathways with no barriers and only slightly above road level. An alternate access is available approximately 400 m upstream of Victoria bridge via a pathway that crosses the river near the helipad facilities at Glebe Farm. The proposed bridge is purpose built for cyclists and pedestrians and will facilitate the movement of students between UTAS facilities at Inveresk and those to be built on the future on land in Willis St. It will also provide an alternative pathway to facilities such as the aquatic centre, city park and sport and recreational areas off Racecourse Crescent. Alternatives to the proposal are that the existing crossings continue to be used.

1.5 Current status of the proposal

Table 1 outlines the key steps in the approvals process.

Table 1 Required approvals

Approvals component	Comment
Key PWS and other statutory approvals required.	An RAA is required prior to any works. This is required to support the DA which is to be lodged with Launceston City Council.
Current status of the proposal identifies what has been done to date and what other assessments and approvals are required.	This RAA is submitted for consideration A DA and planning report have been prepared – this includes ecological assessment, preliminary site assessment (contaminated lands) and a construction environmental management plan. Use and development standards within the planning assessment require an approved RAA to satisfy acceptable solutions. A request for landowner consent has been submitted to the Crown Lands Service (CLS) in relation to works on the river bank
Environmental, planning and building legislation, standards and guidelines that will be applicable (such as policies, regulations and industry codes of practice).	A DA is required for a Discretionary level of assessment – this cannot be lodged without RAA approval and CLS consent to lodge. The bridge has been designed to be fully accessible and satisfies National Construction Code requirements
Other relevant Commonwealth, State and Local Government policies, strategies and management plans with which the proposal would be expected to comply.	There are no Commonwealth approval requirements The bridge is to be constructed partly on Crown land administered by DPIWPE – a request for landowner consent to lodge the DA has been lodged

An examination of how the proposal relates to any other proposals that have been or are being developed or that have been approved in the area affected by the proposal

There are no similar projects proposed in the locality. A pedestrian bridge was recently constructed closer to the mouth of the North Esk River to connect the North bank development with Seaport and the CBD.

2. Proposal description

2.1 Location

The site of the proposed works includes the bed and banks of the North Esk River with the bridge ends located on the levee on either side. The bridge will extend from the levee near the Inveresk student accommodation building to the UTAS site on the corner of Boland and Willis Streets. A map showing the site of the proposed bridge is provided at Figure 1.

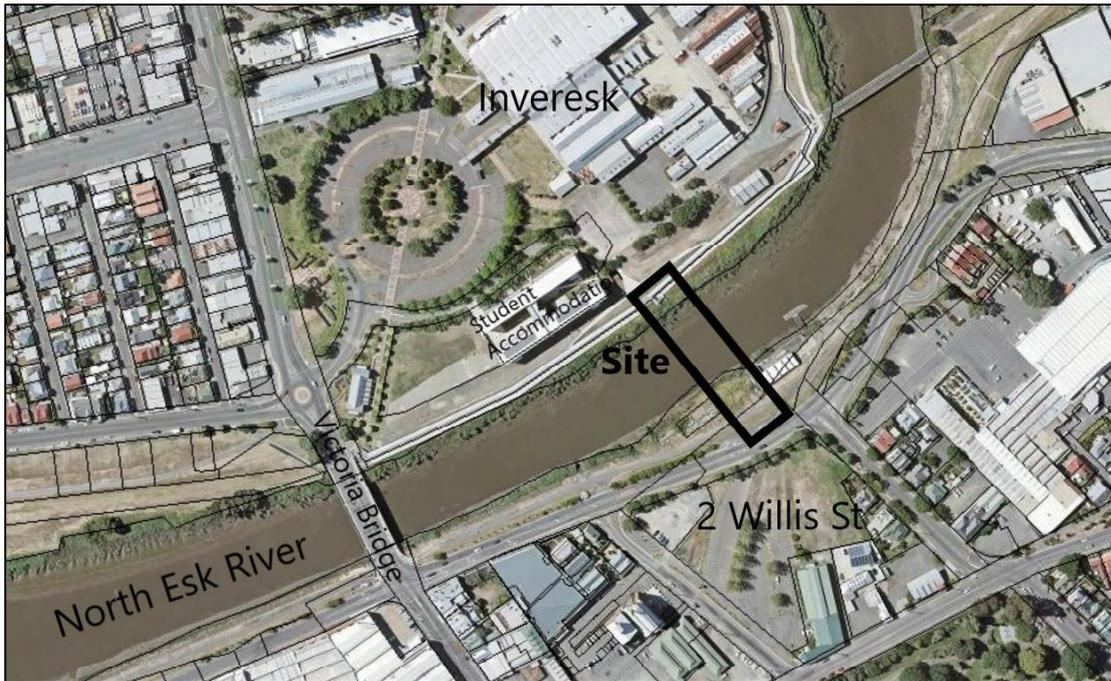


Figure 1 Location of the proposed bridge

2.2 Need, demand

The proposed bridge will allow free movement of students between the Inveresk campus and proposed facilities on the southern side of the river. It will also provide an alternative access to retail and recreational facilities to the east of the CBD. It will also accommodate public foot traffic during football games and other events at UTAS stadium and Inveresk reducing the volume across Victoria Bridge.

2.3 Site identified for development

2.3.1 Site analysis plan

The site of the bridge has been selected to minimise disturbance of the river bank and to avoid construction on the levee. The alignment is the natural direct path between Inveresk and the UTAS owned site in Willis St. Works within the river channel have been minimised and limited to two piers at most.

2.3.2 Site plan

Site plans are provided in Appendix A. These include an aerial image with the bridge overlain to assist with the identification of features.

2.3.3 Design criteria and building details

A short link span will be extended from the existing viewing platform on the northern bank, approximately 3 m in length. This will allow connection to the existing graded access from the upper path along the levee to the university grounds to the north. The northern abutment will include piers set into the top of the river bank. A set of stairs, extending the full width of the existing platform, will be constructed on the northern side of the platform to provide an alternative access to the existing ground level pathways around the Inveresk precinct.

The bridge will extend approximately 106 m across the river at a grade of 1:33 and will not incorporate any landings. It will rise 3.05 m in height from north to south and has been designed to tie in with a future bridge span across Boland St and a second floor level access to the future building on the Willis St site. The bridge deck will be 4 m wide between handrails and will have 1.4 m high bicycle safety rails. This increased barrier height is consistent with standard requirements for cyclist safety. A 900 mm high pedestrian hand rail will be provided.

Two piers will be required to support the bridge. These will be located 25-34 m from each of the abutments. The northern most pier (Pier 1) will be located well within the river channel while the southern pier (Pier 2) will be located near the high tide level. The bridge will have a height of 11.942 m from the river bed to the top of the rail at Pier 1 and a height of approximately 4.5 m at Pier 2.

The southern abutment will be located on the southern edge of the levee, on the southern bank of the river. No works are permitted on the levee wall as scouring during flood events could undermine the stability of the levee and the bridge. The bridge will extend over the existing path that sits on top of the levee and will terminate at a landing constructed adjacent the southern base of levee. The bridge will have a height of 7.573 m above the Boland St pavement and will provide a clearance of 2.7 m between the path and the bridge superstructure below the bridge deck.

A 1:14 grade ramp, 2.5 m in width, will be constructed at the southern end of the bridge to provide graded access to the levee path. This will extend above the riverbank and level wall to a point where the levels are equal. The ramp will be supported by a series of piers located on the wide gently sloped riverbank area. The ramp will be curved toward the river bank and will cover a span of approximately 70 m. It will include 1.2 m long landings every 9 m due to the grade. A set of 2 m wide stairs will be constructed on the eastern side of the bridge to provide an alternative access to the pathway on the levee. These will tie in to the southern wall of the levee.

3. The existing legislative, policy and planning environment

3.1 Planning aspects

3.1.1 Title

Provide information on land tenure and property boundaries of the proposal and areas subject to operation.

The proposed bridge also involves works on the bed and banks of the river. All affected land parcels are identified in the table below. The focus of this RAA is the piers required under the main deck of the bridge. Pier 1 will be located within the river channel and will be sunk into the bed of the river. Pier 2 is proposed to be located at the extent of the highest astronomical tide. For the purposes of the DA it was assumed the pier was in the Environmental Management zone. However, the final location may be on DPIPWE land or PWS land. It has been included in this RAA to ensure impacts are considered if required. A map showing the jurisdiction of each land manager is provided in Figure 2.

Component	Address	Property ID	Title Reference	Authority
Pier 1	Bed of the North Esk River	CID1118112	Tamar Conservation Area under the <i>Nature Conservation Act 2002</i>	Parks and Wildlife Service
Access for works and laydown area (includes existing viewing platform)	2 Invermay Rd Invermay	3389971	174633/2	Launceston City Council
Northern abutment	Northern bank of the North Esk River	CID 1306571	Public Reserve under the <i>Crown Lands Act 1976</i>	DPIPWE
Pier 2	Southern bank of the North Esk River	CID 1306571 or CID1118112	Public Reserve under the <i>Crown Lands Act 1976</i> or <i>within the Conservation Area</i>	DPIPWE or PWS
Southern abutment	Levee adjacent Boland St	Subdivision road	144355/1	Launceston City Council

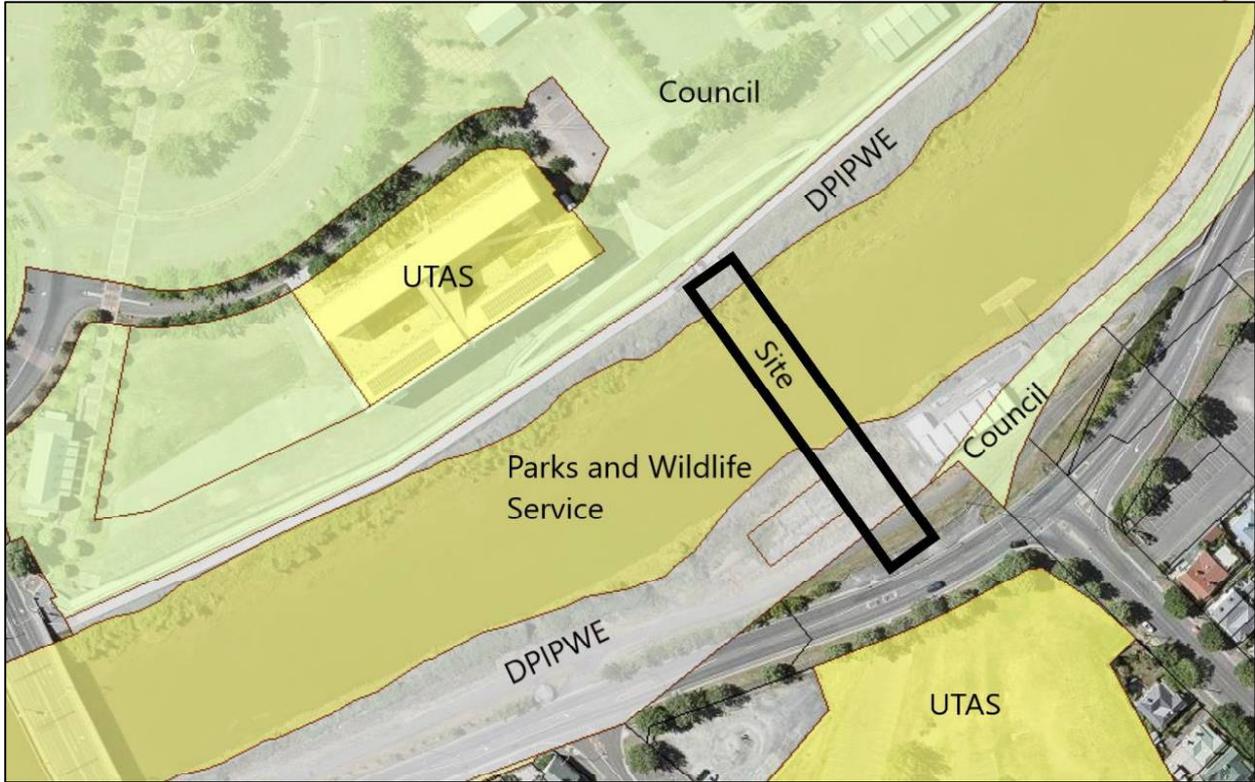


Figure 2 Relevant land managers within the Project area

3.1.2 Legislation

3.1.2.1 Land Use Planning and Approvals Act 1993 (LUPAA)

The relevant land use document is the Launceston Interim Planning Scheme 2015 (the Planning Scheme). The viewing platform, and location of the northern abutment is zoned Particular Purpose PPZ 4 - Inveresk site. The river, where pier 1 is located and potentially the location of Pier 2, is zoned Environmental Management. The southern abutment is zoned Open Space. The site zoning is shown on Figure 3. The proposed bridge falls within the Utilities use class. Utilities are a Discretionary Use in each of these zones.



Figure 3: Zoning of the subject land (Source ListMap)

3.1.2.2 Environmental Protection and Biodiversity Conservation Act 1999

An ecological assessment was undertaken for the site of the proposed works (see Appendix B). No Matters of National Environmental Significance were identified and no referral under the EPBC Act is considered necessary.

Table 2 Summary of compliance with applicable legislation

Acts and Regulations	Compliant	Potentially Compliant	Not Compliant	Not Applicable	Details
<i>National Parks and Reserves Management Act 2002</i>	X				
<i>Crown Lands Act 1976</i>	X				
<i>Nature Conservation Act 2002</i>				X	
<i>Threatened Species Protection Act 1995</i>				X	
<i>Aboriginal Relics Act 1975</i>	X				
<i>Historic Cultural Heritage Act 1995</i>				X	
<i>Land Use Planning and Approvals Act 1993</i>	X				
<i>Environment Protection and Biodiversity Conservation Act 1999</i>				X	No referral is required
<i>Work Health and Safety Act 2012</i>	X				
<i>Environmental Management and Pollution Control Act 1994</i>	X				
<i>Water Management Act 1999 / State Policy on Water Quality Management 1997</i>	X				
<i>Fire Service Act 1979</i>				X	
<i>Forest Practices Act 1985</i>				X	
<i>Living Marine Resources Management Act 1995</i>				X	
<i>Mineral Resources Development Act 1995</i>				X	
<i>Building Act 2016 and Regulations.</i>	X				
<i>State Coastal Policy 1996</i>	X				
<i>Other:</i>					None

3.1.3 Policies and plans

There is no applicable reserve management plan or policies. The site of the bridge is not within any wilderness area of other significant area within the reserve estate.

4. Engagement

Stakeholder engagement has included consultation with Council and flood regulators regarding impacts on the levee system. No community engagement has been undertaken however this will form part of the DA process under LUPAA. This process also incorporates appeal rights for the proponent and the community.

5. Economic

The proposed bridge will provide a community function and will not operate as an economic activity of any kind. The bridge will be constructed by UTAS and will become a Council asset and Council will assume maintenance responsibility.

6. Environmental Impact and Management

6.1 Methodology

An ecological assessment (Appendix B) was prepared for the site of the proposed works. An environmental site assessment (ESA - Appendix C) was also undertaken to identify any risks associated with the potential presence of contaminated soils on either side of the river. Geotechnical assessments were undertaken to determine the areas to be avoided on the riverbank to prevent impacts on the levee system.

6.2 Environmental Impacts

Works within the PWS managed land include the driving of the two main support piers. One is located in the main channel and the other is located within the intertidal area (at the highest astronomical tide level).

The existing values, potential impacts and control actions are outlined in Table 3.

Table 3 Summary of environmental impacts and management

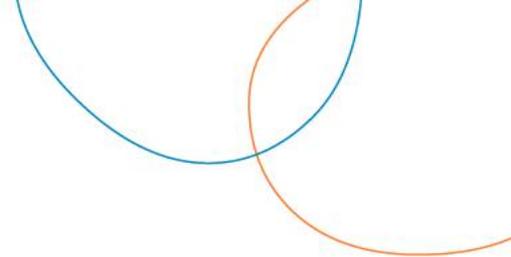
Environmental Aspects	Existing Conditions	Impact Assessment	Control Actions
<p>Biodiversity</p>	<p>The North Esk River offers habitats for a range of aquatic flora and fauna.</p>	<p>The works involve driving piles which will result in displacement of a very limited area of the available habitat. Potential short-term impacts include increased turbidity and noise. However, the latter is unlikely to have any significant impact on any species.</p>	<p>Works will be carried out using techniques focusing on minimising dispersal of sediment during pile driving.</p>
<p>Flora</p>	<p>The banks of the river have been highly modified and are dominated by introduced species, with 24 of the 29 species of flora recorded being introduced. No threatened vegetation communities are present and no threatened flora species were identified during the survey. Paterson's Curse (<i>Echium plantagineum</i>), Blackberry (<i>Rubus fruticosus</i>) and Crack Willow (<i>Salix alba X fragilis</i>) are identified as Declared Weeds under the Weed Management Act and are also identified as Weeds of National Significance.</p>	<p>Weeds on the riverbank are typically spread through the dispersal of seeds and propagules in river flows and during flood events. The proposed construction is unlikely to exacerbate the rate of spread of weeds as only small areas are to be disturbed. There were no aquatic weeds observed within the river and the proposed pile driving will not alter this. The use of the bridge by pedestrians will not alter the status of weed infestations.</p>	<p>Appropriate weed hygiene measures will be implemented throughout construction to prevent the spread of weeds into or from the site.</p>
<p>Fauna</p>	<p>The disturbed nature of the river bank offers little in terms of habitat for fauna species with eight species observed, seven of these being birds. None are listed as threatened under state or federal legislation. One is listed as marine under the Federal EPBC Act, however, this has no implications outside a Commonwealth marine area. A number of migratory shorebirds species which are also listed as threatened under the EPBC Act are included in the protected matters search as potentially occurring. These could possibly utilise the extensive mud flats exposed at low tide. Australian grayling could also potentially occur within the river which is known as a migratory path for this species.</p>	<p>There will be some short-term disturbance of fish and bird species using the river channel during pile driving works. The background level of noise and activity will most likely disperse any fish individual in the vicinity prior to driving. There will be limited turbidity increase during works, however, this will be short term, but when compared to background river conditions, is not considered unacceptable. Works in the intertidal zone will be managed to prevent any escape of sediment laden stormwater into the river. There will be no temporary or permanent barriers to fish passage as a result of the bridge construction and no impacts are considered likely on Australia grayling or other fish species.</p>	<p>To reduce the potential for increased sediment loads, works will be undertaken in accordance with Environmental Best Practice Guidelines 2 (Construction Practices in Waterways and Wetlands) as outlined in the Wetlands and Waterways Works Manual. These are outlined in the CEMP prepared for the project (Appendix D) and include the use of diversion bunds, catch drains, etc to capture sediment.</p>

Environmental Aspects	Existing Conditions	Impact Assessment	Control Actions
Water Quality	Water within the North Esk River typically has quite high levels of silt.	The proposed works will not result in any long term or permanent changes to silt levels within the river.	Best practice silt control and piling techniques are recommended for instream activities. A Surface Water and Sediment Management Plan should be implemented for those activities adjacent the river (ie Pier 2 and ramp supports on the southern bank).
Potentially contaminated soils	Soils either side of the river were assessed to determine the potential for contamination. The ESA consisted of a site history review, site inspection and limited soil sampling and chemical analysis to identify potentially contaminated areas and specific contaminants of concern. The site historical review indicated no contaminating activities directly associated with the site, however, contaminated soil may have been transported onto the site during the construction of the flood levees. There are no records documenting the demolition of the small building on the southern side of the river, therefore hazardous materials which may have been in the building, may have been distributed in surface soils onsite. These could potentially migrate to the river if disturbed. The review of historical records indicated the presence of contamination in nearby sites and activities commonly associated with contamination.	Based on the surrounding commercial/industrial land use, and the levees which required material to be imported onto the site, it is possible that contaminated soil and or groundwater may be present within the project area. There is potential for these to migrate to the river through groundwater movement and there is considered to be a potential risk to aquatic ecological receptors, Metals, PAH, TPHs, BTEX, PCBs, OPs and phenols were identified as potential sources of contamination, however, the identified risks are considered to be acceptable. This was because the soil sampling undertaken does not indicate significant lateral migration of offsite sources of historical contamination in shallow soils and significant remediation works have been undertaken on adjoining sites to reduce the potential for impacts.	A CEMP will be prepared prior to any soil disturbance (Appendix D) to ensure disturbed soil is inspected and treated appropriately. A Surface Water and Sediment Management Plan will be implemented to prevent surface water or sediments from entering the North Esk River. Excavated soils should be temporarily stockpiled to facilitate a visual inspection of the material and sampling for waste classification purposes in accordance with EPA Guidelines. An Unexpected Finds Protocol should be prepared and implemented where suspected contaminated or hazardous materials are encountered during excavation works.
Acid sulphate soils	The project area generally has high potential for disturbance of acid sulphate soils.	The piling works will not result in the exposure of any acid sediments to the air.	Monitoring of soils in disturbance areas for signs of acid sulphate soil will allow for appropriate treatment if required
Geodiversity	There are no Geoconservation sites or other features of geological significance impacted		

Environmental Aspects	Existing Conditions	Impact Assessment	Control Actions
Estuarine or Marine	<p>The lower North Esk River is tidal and large areas of mud flats are exposed at low tide. There are long standing issues associated with siltation and poor water quality in the Tamar River estuary and North Esk River. The estuary has been dredged and raked in the past to try to remove excess sediment. However, significant volumes of silt continue to enter the system due to poor land management techniques upstream. Further, there are numerous sources of pollution entering the river such as stormwater and sewerage treatment plant discharge.</p>	<p>Soil disturbing works on either bank or within the river have the potential to increase sediment loads in the river. Management of excess silt is required to ensure current problems are not exacerbated. There is unlikely to be any impact on water quality as a consequence of the construction or operation of the bridge.</p>	<p>A Surface Water and Sediment Management Plan should be implemented to prevent surface water or sediments from entering the North Esk River. No vehicles are permitted to be stored on the river bank or levee.</p>
Cultural	<p>Currently pedestrians cross at Victoria Bridge which is an older bridge with no safety barriers, not ideally suited to large crowds, as experienced during popular football games, such as AFL game days.</p>	<p>The ridge will allow pedestrians to cross at an alternative location which will enhance safety and the enjoyment of attending events.</p>	<p>None required</p>
Aboriginal Heritage	<p>A search was undertaken of the Aboriginal Heritage Property register (Appendix E).</p>	<p>The area is highly disturbed and has been modified by dredging, levee construction and works on the riverbank. The potential for sites to remain on the river bank are low. The bed of the river is unlikely to hold any artefacts or relics due to its inaccessibility.</p>	<p>An unanticipated discovery plan will be implemented during works in the event any relics are encountered.</p>
Historic Heritage	<p>There are no known heritage sites within the North Esk River</p>	<p>None likely</p>	<p>None required</p>
Landscape	<p>The bridge falls within the North Esk River Scenic Management area. Management Objectives for this Precinct include the following relevant requirement for works within the river channel: <i>Development within the Precinct must either complement existing historic development located nearby, or be designed to minimise the visual impact within the landscape, particularly when</i></p>	<p>The bridge is required to extend from one levee to another and as such is elevated above the river. It will be visually prominent and has been designed to complement the industrial themes which are prominent on the Inveresk site and the old Launceston gas works. It will also tie in with the future university building on the corner of Willis St and Boland St. The management objectives</p>	<p>The bridge has been designed to address the scenic values of the North Esk River.</p>



Environmental Aspects	Existing Conditions	Impact Assessment	Control Actions
	<p><i>viewed from major public thoroughfares and viewpoints. Where possible, visually prominent development should be avoided, particularly in the vicinity of the North Esk River</i></p>	<p>suggest that visually prominent development should be avoided in the vicinity of the North Esk River, however, it is not possible to construct a bridge that meets flood avoidance requirements without being elevated. The design incorporates a flat, sloped deck and low key side barriers. The bridge could have included a curved deck or cable stay designs but a less obtrusive design has been chosen to minimise scenic impacts.</p> <p>When viewed against the backdrop of the Inveresk site or Launceston to the south the bridge presents as a low key element. Bridges are a necessary development across rivers and the construction of this pedestrian bridge in this location is considered appropriate</p>	
Existing leases and licenses	There are no existing leases or licenses within the river	Not applicable	Not applicable
Topography	The site of the proposed bridge is within the North Esk River channel. The northern bank is relatively steeply sloping while the southern bank is moderate to gently sloping and incorporates a level area once containing a rowing shed. The river profile, as determined by bathymetric survey, is shown on the plans in Appendix A.	There will be no change to the profile of the river bed or banks as a result of construction.	Not applicable



6.3 Social Aspects

The bridge will offer a safe, more appropriately located link between future UTAS facilities than the current Victoria Bridge crossing and will provide a wider community benefit when events are held at the UTAS stadium. The bridge will accommodate the many pedestrians and cyclist who currently use the path on top of the levee and provide an easier route for crossing the river. The bridge will be used by university students and the local community as well as visitors accessing Inveresk or Launceston. Only Pier 1 is within the main river channel and is not considered likely to hinder recreational boating in the river.

6.4 Natural Hazards

The works are predominantly above flood level, being located above the levee. The piers and support for the ramp may accumulate debris during flood events however these are single pylon structures presenting a small surface area and no obstacles to entangle debris. The bridge will not cause the diversion or displacement of any flood waters and will not have any significant impact on flood levels. No works associated with construction will have any impact on flooding behaviour.

The location for the bridge is the most logical to meet the future needs of the city and the university. The works are located on or near the existing flood levees but will not impact on the structural integrity or functioning of the levees in any way. The bridge itself will not be impacted by flooding and will be designed to withstand flows.

7. Monitoring and review

The commitments throughout this RAA are summarised in Table 4 and the required nonrioting for each outlined. No ongoing review is considered necessary as the construction will be short term and the on-going impacts are not considered significant or measurable.

Table 4 Commitments and monitoring process

Number	Commitment	Monitoring
1	Works will be carried out using techniques which will minimise the amount of sediment released during pile driving.	Works will be observed by the contract supervisor – once piles are driven there will be no ongoing impact
2	Appropriate weed hygiene measures will be implemented throughout construction to prevent the spread of weeds into or from the site.	Throughout construction – contract supervisor will monitor
3	Works will be in accordance with the Wetlands and Waterways Works Manual	These are incorporated into the requirements of the CEMP and will be implemented throughout construction
4	A Surface Water and Sediment Management Plan will be implemented to prevent surface water or sediments from entering the North Esk River.	Daily inspections of any installed sediment control devices to identify leaks or ruptures

Number	Commitment	Monitoring
5	A CEMP will be prepared prior to any soil disturbance to ensure disturbed soil is inspected and treated appropriately.	These are incorporated into the requirements of the CEMP and will be implemented throughout construction
6	Excavated soils should be temporarily stockpiled to facilitate a visual inspection of the material and sampling for waste classification purposes in accordance with EPA Guidelines.	Soils to be inspected upon excavation by suitably qualified person and appropriate treatment designed and administered
7	Monitoring of soils in disturbance areas for signs of acid sulphate soil will allow for appropriate treatment if required	Soils to be inspected upon disturbance by suitably qualified person and appropriate treatment designed and administered
8	An Unexpected Finds Protocol should be prepared and implemented where suspected contaminated or hazardous materials are encountered during excavation works.	Soils to be inspected upon excavation by suitably qualified person and appropriate treatment designed and administered
9	No vehicles are permitted to be stored on the river bank or levee.	Daily inspection by contract manager and observations throughout construction
10	An unanticipated discovery plan will be implemented during works in the event any Aboriginal artefacts are encountered.	Contract supervisor

8. Commitments

This section should contain a consolidated commitments table listing all of the commitments made throughout the RAA.

Commitment	Section	Timing	Who is responsible	Plan required?
1	6.2	During works	Contractor	Operational requirement
2	6.2	Prior to works commencing	Contractor	CEMP
3	6.2	Prior to and during works	Contractor	Incorporated in to CEMP
4	6.2	During works	Contractor	Implementation of CEMP
5	6.2	Prior to works	Consultant	CEMP

Commitment	Section	Timing	Who is responsible	Plan required?
6	6.2	During works	Contractor and consultant if required	Implementation of CEMP
7	6.2	During works	Contractor and consultant if required	Implementation of CEMP
8	6.2	During works	Contractor and consultant if required	Implementation of CEMP
9	6.2	During works	Contractor	Implementation of CEMP
10	6.2	During works	Contractor and AHT if required	Unanticipated discovery plan

9. Conclusion

The proposed bridge has limited potential to impact on the natural values of the North Esk River. Key threats are related to the potential for the release of sediments in to the water, including the potential for contaminated soils and acid sulphate material. The chances of either of the latter happening are considered to be low and a number of avoidance and management measures are proposed to minimise risks. Appropriate sediment control measures are also proposed to minimise the potential for the escape of sediment to the river from disturbance on the river banks.

Impacts on flora and fauna will be limited, due largely to the poor condition of habitats on the river bank. These areas have been highly modified and weed infestation is significant. Water quality within the river is generally poor with high sediment and nutrient levels for poor management of land upstream and multiple discharges of waste water. The construction of the bridge, and the driving of two piers, will not impact significantly on this. There will be no obstruction of fish passage as a result of bridge construction.

The ability of the community to enjoy the North Esk River will not be significantly reduced by the proposed bridge. Navigation within the river channel is limited by the tidal movements which expose large mudflats at low tide. Navigation will still be possible after driving of the pier is completed. The view east or west along the river will be altered, however, this will be consistent with the industrial / urban nature of development at the Inveresk site and that presented by the former gas works and other municipal style buildings along Boland St. There are significant community benefits in the provision of a purpose-built crossing at this locality which can serve the wider community as well as students and faculty of the university in the future.

References

pitt&sherry 2019. Construction Environmental Management Plan Proposed UTAS Pedestrian Bridge, Invermay

pitt&sherry 2019. Phase 1 Environmental Site Assessment Proposed UTAS Pedestrian Bridge Invermay

Umwelt 2019. University Of Tasmania Proposed Footbridge Flora and Fauna Assessment Report, Umwelt (Australia) Pty Limited

Plans of the proposed bridge

Appendix A

 **PLANNING EXHIBITED
DOCUMENTS**

Ref. No: DA 0312/2019

Date advertised: 21/09/2019 *Daggs*

Planning Administration _____

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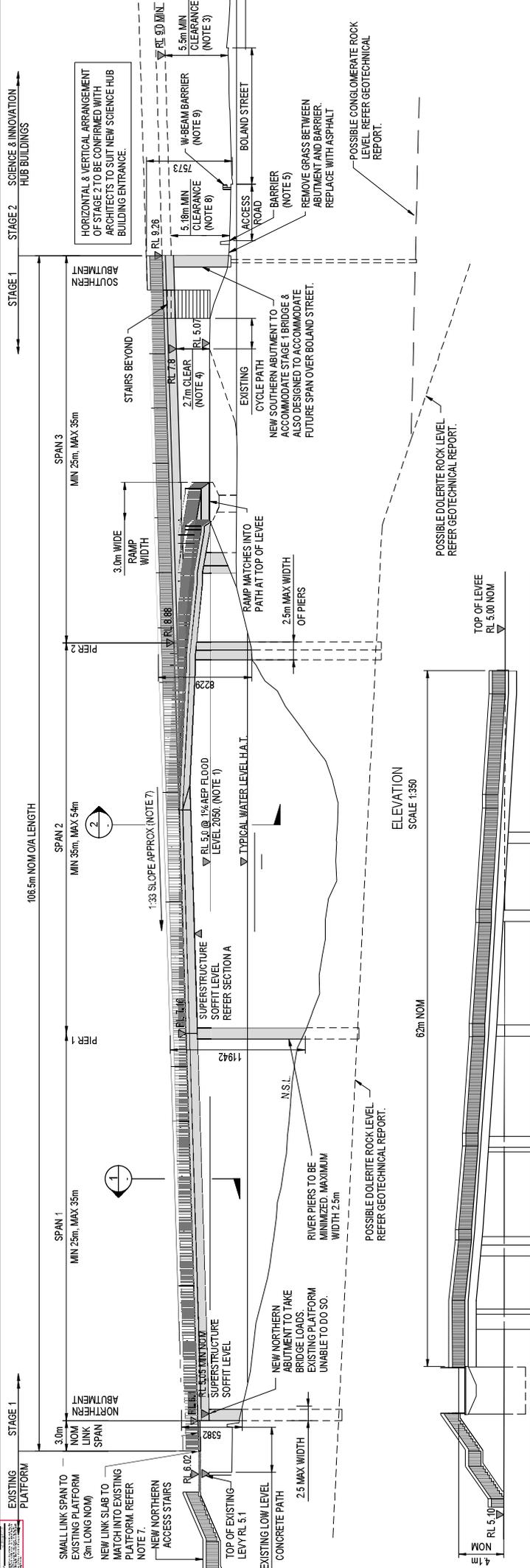
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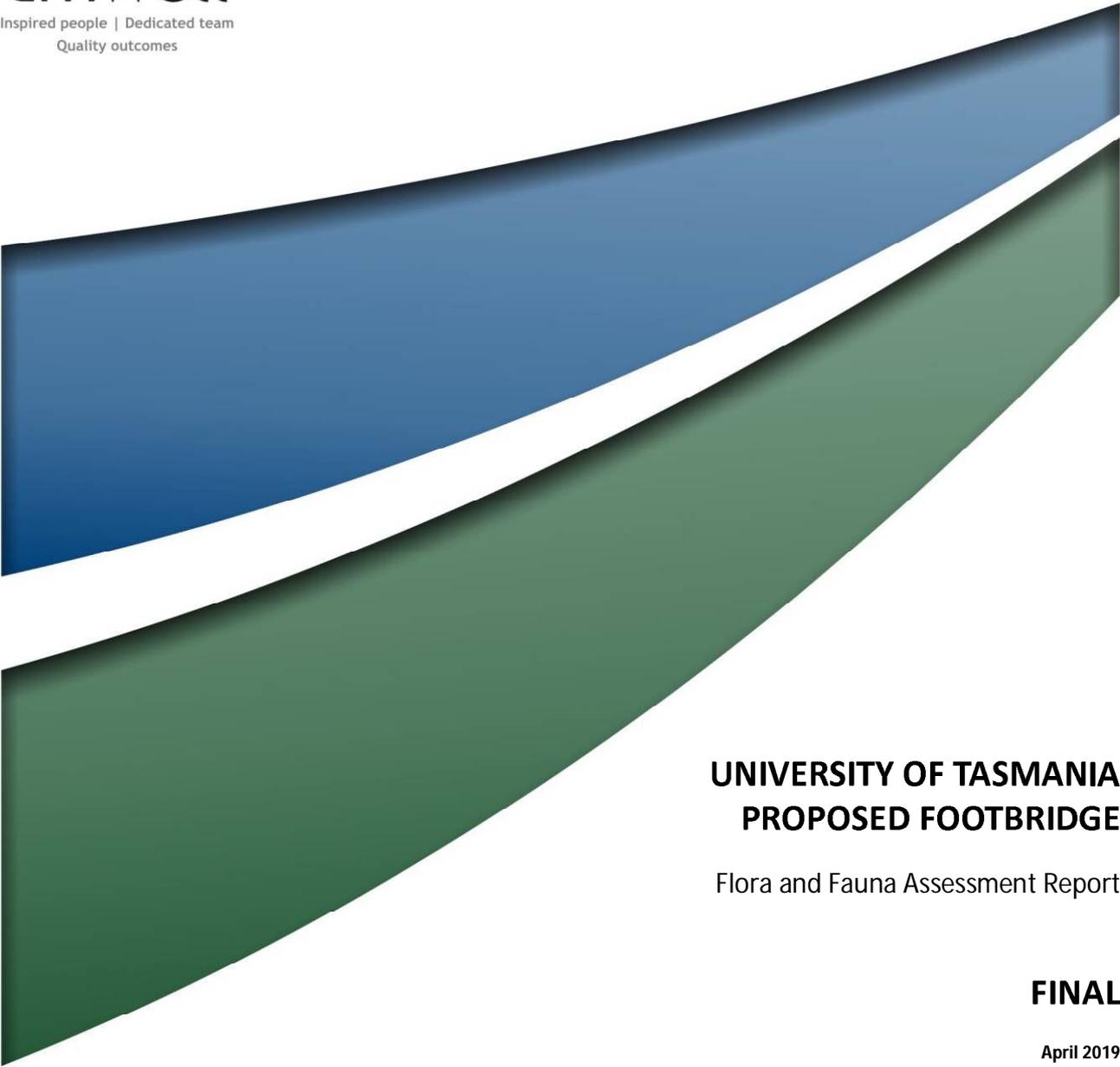
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Ecological Assessment

Appendix B



UNIVERSITY OF TASMANIA PROPOSED FOOTBRIDGE

Flora and Fauna Assessment Report

FINAL

April 2019

UNIVERSITY OF TASMANIA PROPOSED FOOTBRIDGE

Flora and Fauna Assessment Report

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Pitt and Sherry Pty Ltd

Project Director: Travis Peake
Project Manager: Richard Floyd
Report No. R01
Date: April 2019



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Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
Final	Richard Floyd	15/4/2019	Travis Peake	16/4/2019

Executive Summary

The University of Tasmania (UTAS) is proposing the construction of a pedestrian-cycle bridge from the existing pedestrian landing on the northern bank of the North Esk River, across the river to the southern bank of the North Esk River to link to a future UTAS facility.

This flora and fauna assessment investigates the natural values of the banks of the North Esk River adjacent to the existing and proposed UTAS campus buildings where bridge structures and associated construction components will be located.

Vegetation

The vegetation along the banks of the North Esk River consists of highly disturbed riparian vegetation. No Threatened Ecological Communities identified under either the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or the Tasmanian *Nature Conservation Act 2002* (NC Act) was recorded in the Study Area.

Threatened Flora

No threatened flora as listed under either the Commonwealth EPBC Act or the Tasmanian *Threatened Species Protection Act 1995* (TSP Act) were recorded within the Study Area. Assessment of available habitats using the results of the field survey indicates that due to historic disturbance associated with urban development in the Study Area, threatened flora species are considered unlikely to occur.

Threatened Fauna

No threatened fauna were recorded within the Study Area, during the field survey. The proposed development will not impact any critical habitat



elements for any threatened species identified with potential to occur including Tasmanian wedge-tailed eagle, grey goshawk, white-bellied sea-eagle, Australasian bittern or the fish species Australian grayling. Various mitigation measures are proposed to minimise impact of sedimentation; siltation and erosion upon the riparian habitats adjacent to the construction area. These mitigation measures are proposed to be detailed within a Construction Environmental Management Plan (CEMP) for the project.

Weeds

Three declared weeds as listed under the *Weed Management Act 1999* (WM Act) (crack willow, were identified within the Study Area. It is recommended that a weed management plan be included in the CEMP. The weed management plan should include measures to treat weeds prior to construction activities to minimise spread of weeds during construction, and appropriate monitoring and control measures are implemented following construction to ensure the site is sustainably rehabilitated.

Implications and Requirements

Provided the recommended mitigation measures are implemented, the proposed development is unlikely to result in any significant impacts to any matters of National Environmental Significance identified under the EPBC Act. Further to this, no significant impacts are expected to result on any Tasmanian species listed under the TSP Act.

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Appendix C	Flora of Conservation Significance
Appendix D	Fauna of Conservation Significance
Appendix E	Commonwealth Impact Assessment

1.0 Introduction

Umwelt (Australia) Pty Ltd was commissioned by Pitt and Sherry Pty Ltd on behalf of the University of Tasmania (UTAS) to undertake a terrestrial flora and fauna assessment for the proposed installation of a pedestrian/cycle bridge at UTAS, Launceston Tasmania. The bridge will provide a link between the campus located on the bank of the North Esk River in Inveresk to proposed new campus facilities to be located on the southern side of the river, adjacent to Boland Street, near the city of Launceston (**Figure 1.1**).

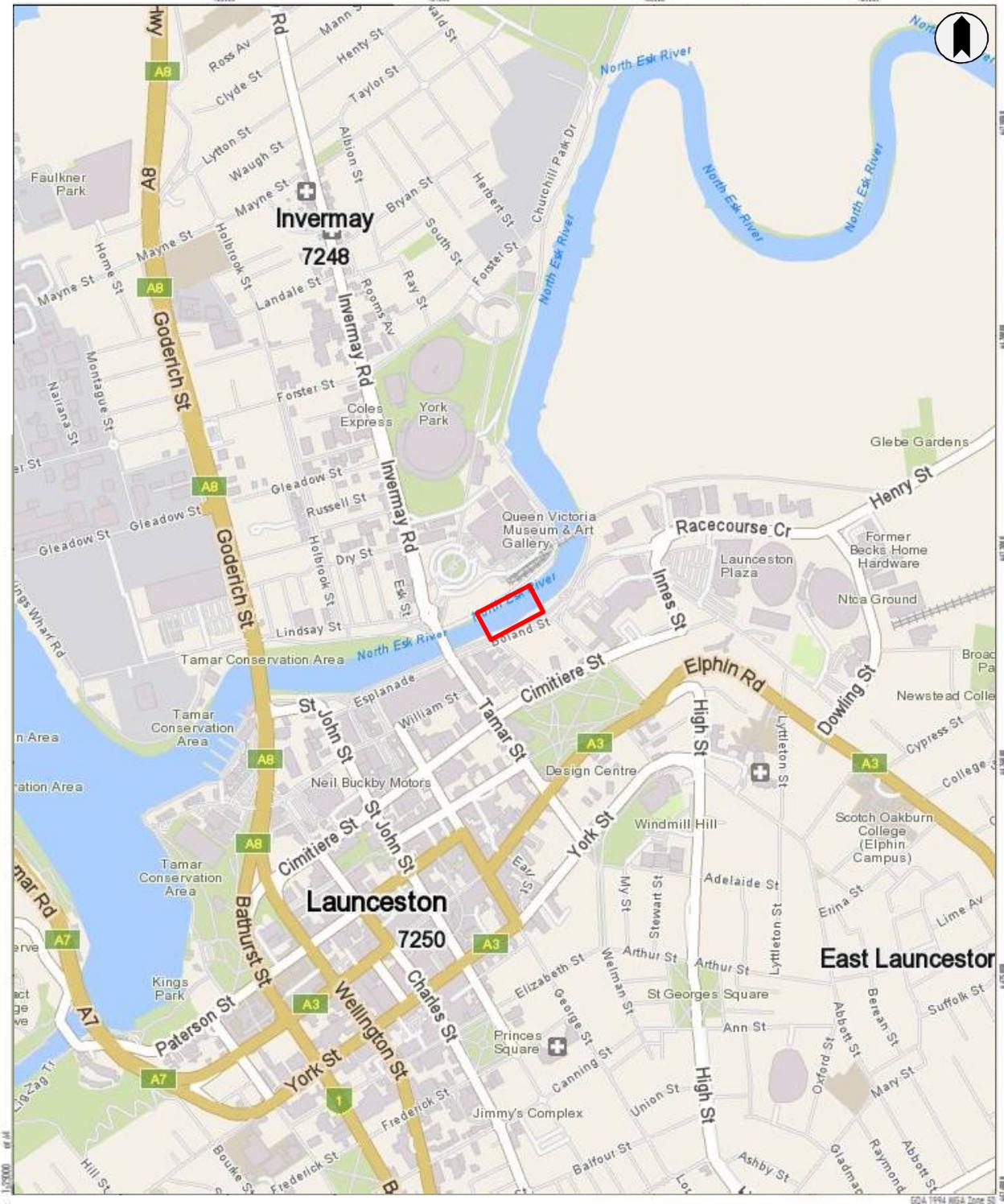
The terrestrial flora and fauna assessment consists of a two stage process involving literature review followed by a field assessment, undertaken in December 2018. The literature review analysed existing ecological data to identify conservation significant flora and fauna species as well as conservation significant vegetation communities present within the areas proposed for construction of the cycle-way bridge. This review formed the basis of the field survey, in which potentially occurring conservation significant flora, fauna or vegetation communities were targeted and ecological values documented.

For the purposes of this report, the 'Study Area' refers to an area 100 metres (m) either side of the location of the proposed bridge as shown in **Figure 1.1**. Noting that, the assessment was restricted to the banks and fringing vegetation of the river and did not extend into the open channel of the river.

1.1 Study Aims and Objectives

The aims of this assessment were to document terrestrial flora, terrestrial fauna and vegetation communities within and adjacent to the Study Area, with particular reference to the occurrence of conservation significant species and vegetation communities. In meeting this aim, the objectives of the study was to:

- Review existing terrestrial flora and fauna data for the Study Area and surrounding areas;
- Provide baseline data on vegetation associations and any Threatened Ecological Communities (TECs) occurring in the Study Area;
- Describe the diversity of the terrestrial flora found within the Study Area;
- Describe the diversity of the terrestrial fauna found within the Study Area;
- Identify the occurrence or expected occurrence of conservation significant flora and fauna species;
- Identify the occurrence of weed species and their distribution across the Study Area;
- Assess the potential significance of impacts from the proposed development on terrestrial flora and fauna values in the context of relevant legislation, in particular the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the Tasmanian *Nature Conservation Act 2002* (NC Act), *Threatened Species Protection Act 1995* (TSP Act), and the *Weed Management Act 1999* (WM Act); and
- Provide measures to avoid or mitigate adverse impacts on significant terrestrial species and communities at the design, construction and operational phases of the project.



Legend

FIGURE 1
Location Map

Image Sources: Sources: Esri, HERE, Garmin, Inetmap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeBCO, IGN, Kabzonar NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, © OpenStreetMap contributors, and the GIS User Community
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Table 1.1 Proposed Construction Activities Identified within Figure 1.2 for Proposed Bridge

Area	Proposed Construction Activities
Area 1	This area to be mainly used as hard stand area for cranes to lift bridge components into position. Existing disturbed area. Unlikely to be any significant disturbance and excavation is not expected.
Area 2	Stair or ramp connection to Inveresk Precinct. Excavation up to 1.0 m in depth in the immediate bridge abutment location (see Area A) and also driving piles into the ground. Remainder of area used for access/storage and no excavation expected.
Area 3	Driving pylon below water. No excavation proposed.
Area 4	Excavations up to 1 m deep in areas B and C. The remaining area to be used for site sheds, machinery movements, storing equipment etc.

1.3 Study Area

The Study Area consists of a 250 m wide strip along the foreshore of both the northern and southern banks of the North Esk River, centred on the identified location for the proposed cycle-way bridge. This area has been investigated to allow for any modifications to the site layout that may become necessary as the project progresses.

1.4 Topography

The Study Area occurs on the North Esk River flood plain. This area has been extensively modified through the construction of an earthen levee on the southern bank and a concrete levee on the northern bank, both of which protect Launceston urban areas.

Expansion of the UTAS campus is expected to occur to the south of the Study Area between Boland Street, Willis Street and Cimitiere Street.

2.0 Regulatory Framework

2.1 Commonwealth

The Commonwealth of Australia under the EPBC Act provides for listing of and protection to matters of national environment significance (MNES) including, but not limited to, threatened species, threatened ecological communities (TECs) and migratory species. Should a listed matter be significantly impacted, the Minister of the Environment must approve the activity causing the impact.

2.2 Tasmania

2.2.1 Threatened Species Protection Act 1995

Any impacts on threatened plant species listed under the TSP Act would require a 'Permit to Take' from the Policy and Conservation Assessment Branch (PCAB) at the Department of Primary Industries, Parks, Wildlife and the Environment (DPIPWE).

2.2.2 Nature Conservation Act 2002

Schedule 3A of the NC Act lists native vegetation communities in Tasmania considered to be threatened. Provisions under Local Government Planning Schemes call upon this list to regulate clearing of these communities where they occur.

2.2.3 Weed Management Act 1999

The WM Act is the principal legislation concerned with the management of "declared weeds" in Tasmania. Under the WM Act, the State Government may:

1. *Prohibit the introduction of declared weeds into Tasmania.*
2. *Undertake the eradication of declared weed species.*
3. *Take action aimed at preventing the spread of declared weeds within Tasmania.*
4. *Require that action be taken against declared weed species where this is necessary to alleviate or prevent a particular problem.*

Declared weeds will need to be managed during construction to ensure that these species are not spread beyond their current distribution.

2.2.4 Launceston Interim Planning Scheme 2015

Review of the *Launceston Interim Planning Scheme 2015* (the Planning Scheme) indicates that the land on the southern bank of the Study Area consists of Open Space zoned land encompassing the levee and former rowing shed, and Urban Mixed Use zoned land which includes the site of the future university building. The northern bank of the North Esk River is zoned Particular Purpose for the Inveresk Cultural Precinct and is dominated by the Launceston Museum, the UTAS campus site, a large car park and UTAS stadium further to the north. The North Esk River itself is zoned Environmental Management.

The proposed bridge will cross an area mapped on the Priority Habitat Overlay (as a Conservation Area). This area extends from near the bottom of the river bank on both banks and includes the river proper. The proposal also involves works within the water course or within 30 m and as such requires assessment against the Water Quality Code. An assessment against the Planning Scheme requirements is presented in **Section 6.0** of this report.

3.0 Methodology

3.1 Literature Review

The objective of the database searches and literature review is to assist in identifying additional threatened and migratory species, TECs or their habitats that could potentially be impacted by the proposed works.

3.1.1 Data Sources

Databases reviewed as a component of this assessment included:

- Department of Primary Industries, Parks, Water and Environment (DPIPWE) Threatened Species and Communities Database;
- Commonwealth Department of the Environment and Energy (DoEE) online Protected Matters Search Tool (PMST);
- Tasmanian Government Natural Values Atlas (Version 3.7.0); and
- DPIPWE TASVEG 3.0 consisting of mapped vegetation to determine the likely vegetation communities present.

3.1.2 Search Area

Database searches involved two distinct areas for flora and fauna respectively. For threatened flora, a 1 kilometre (km) radius was reviewed using the centre of the proposed bridge location to define the search area. With respect to more highly mobile fauna species, a 5 km search radius was utilised, also using the centre of the proposed bridge to define the search area.

3.2 Field Assessments

A targeted site inspection on 4 December 2018 over 6 hours by a suitably qualified ecologist was undertaken primarily to confirm the presence of threatened and migratory species, endangered populations, TECs or their habitats and any other key ecological features required for assessment as part of this ecological assessment to address Commonwealth, State and Launceston City Council regulatory requirements. Plant nomenclature was based upon Tasmanian Plant Census (de Salas and Baker 2017).

3.2.1 Vegetation Assessment

The field survey was undertaken to verify the TASVEG 3.0 vegetation mapping and type descriptions.

3.2.2 Flora Survey

The site inspection included the following aspects in relation to areas subject to potential impacts:

- ground-truthing vegetation community mapping, including the location and extent of any TECs; and
- identification and recording of the location of threatened flora species.

Particular attention was paid to threatened species records (identified through database searches) that were proximate to the proposed bridge location as well as any TECs previously mapped as potentially occurring with the locality.

Floristic sampling was completed to a level sufficient to describe the composition and condition of any mapped vegetation.

3.2.3 Fauna Survey

Fauna survey was restricted to a habitat assessment, and opportunistic observations. Notes were collected on the presence of tree hollows, logs, and other structures which may provide habitat for fauna species. All fauna species encountered during the field survey were also recorded.

4.0 Results

4.1 Literature Review Results

The following sections provide the results of the literature review components of the assessment. These results are used latter in this report to identify those ecological issues requiring field verified including vegetation units present, available habitats, and potential occurrence for threatened flora, fauna and ecological communities.

4.1.1 Bio-Regional Context

The Study Area occurs within the Tasmanian Northern Midlands IBRA bioregion (Thackway *et al*, 1995).

4.1.2 Soils

The geology of the study area consists of quaternary alluvium deposits. The resulting soils are hydrosols, with potential for acid generation (Forsyth *et al*, 2005).

4.1.3 Conservation Significant Communities

4.1.3.1 Commonwealth

The PMST (**Appendix A**) identified two TECs that are “likely” to occur within the Study Area consisting of:

- *Eucalyptus ovata* – *Callitris oblonga* Forest (Vulnerable); and
- Lowland Native Grasslands of Tasmania (Critically Endangered).

4.1.3.2 State

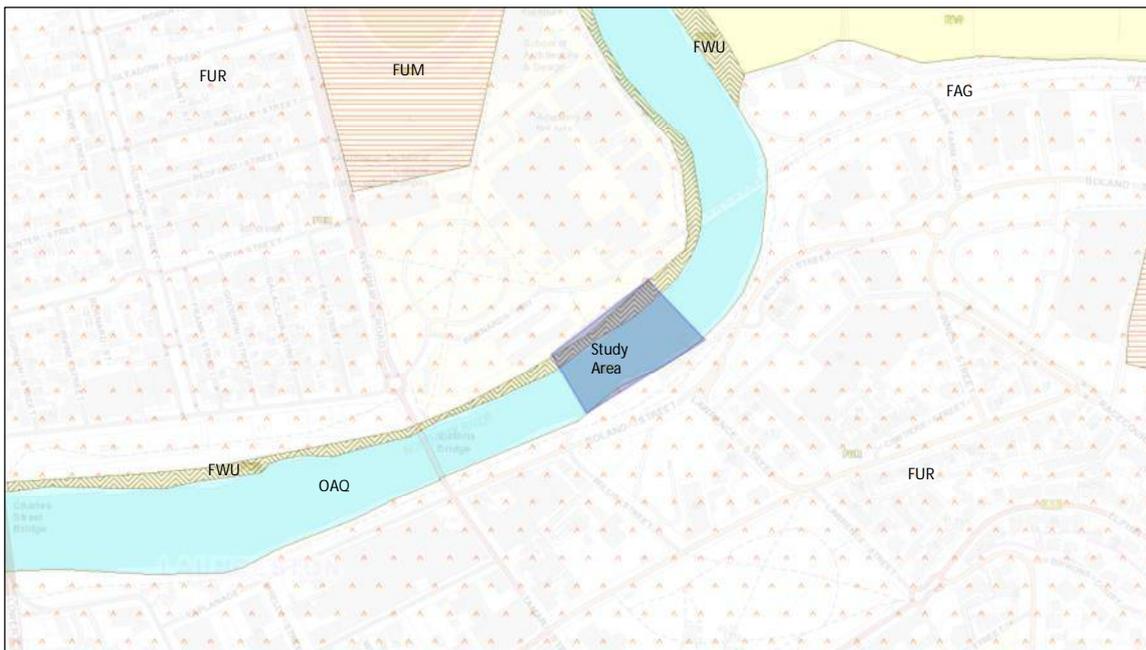
Review of TASVEG 3.0 mapping identified that no native vegetation communities have been mapped within 1 km of the Study Area. No areas of remnant native vegetation are mapped within 5 km of the Study Area.

The mapped communities under TASVEG 3.0 are described in **Table 4.1** and shown in **Figure 4.1**.

Table 4.1 Descriptions of Vegetation Associations Mapped within 1 km of the Study Area

Label	Title	Description
FWU	Agricultural, Urban and exotic vegetation	Urban areas include urban and suburban landscapes. These areas are largely or wholly devoid of vegetation apart from areas such as suburban gardens, street trees and parks. Where vegetation occurs, it is highly variable in composition and is predominantly composed of non-native species.
FUM	Extra-urban miscellaneous	Extra-urban miscellaneous (FUM) represents areas where native vegetation has been replaced with human infrastructure in rural and remote areas.
FUR	Urban Areas	Densely settled urban areas; largely un-vegetated, but including vegetation associated with infrastructure that is within the bounds or closely associated with cities or towns
OAQ	Water, sea	Consists of areas of open water and the ocean.

Source: Kitchener and Harris (2013)



Note Key for Vegetation Mapping is provided in **Table 4.1**. Source: DPIPWE (2018).

Figure 4.1 TASVEG 3.0 Mapping of Vegetation Associations

4.1.4 Conservation Significant Flora Species

Review of available vegetation and soils mapping and location of those threatened flora species identified from both the results of the PMST (**Appendix A**) and the results obtained from the Natural Values Atlas Report (2018) (**Appendix B**), has allowed an assessment to be made of those species with potential to occur within the Study Area. Commonwealth flora species which are likely or which may occur as identified within the PMST but that have not been recorded within 5 km of the Study Area have been excluded from further assessment as they are not expected to occur within the Study Area. The assessment of occurrence is contained in **Appendix C** of this report.

Of the 22 threatened flora species known to occur within 1 km of the Study Area, five have been identified as having potential to occur within the Study Area. No species listed under the EPBC Act were identified as having potential to occur within the Study Area. State listed threatened species, with potential to occur in the Study Area are identified in **Table 4.2**.

Table 4.2 Threatened Flora Species Identified with Potential to Occur within the Study Area

Scientific Name	Common Name	State Status
<i>Schoenoplectus tabernaemontani</i>	river clubsedge	Rare
<i>Hypolepis muelleri</i>	harsh groundfern	Rare
<i>Calystegia sepium</i>	swamp bindweed	Rare
<i>Bolboschoenus caldwellii</i>	sea clubsedge	Rare

4.1.5 Conservation Significant Fauna Species

Review of available vegetation and soils mapping and those threatened fauna species identified from both the results from the PMST Report and the results obtained from the Natural Values Atlas Report, has allowed an assessment to be made of those threatened fauna species with potential to occur within the Study Area. Commonwealth Oceanic species and other threatened species not recorded within 5 km of the Study Area have been excluded from further assessment as they are not expected to occur within the Study Area. Those species previously recorded form the basis of the assessment of potential occurrence, which is contained in **Appendix D** of this report.

Of the 20 threatened fauna species known to occur within 5 km of the Study Area, five have been identified as having potential to occur within the habitats occurring in the Study Area. Three species listed under the EPBC Act were identified as having potential to occur within the Study Area and four species listed under the Tasmanian TSP Act. Those species with potential to occur in the Study Area are identified in **Table 4.3**.

Table 4.3 Threatened Flora Species Identified with Potential to Occur within the Study Area

Scientific Name	Common Name	Commonwealth Status	State Status
<i>Aquila audax</i> subsp. <i>fleayi</i>	Tasmanian wedge-tailed eagle	Endangered	Endangered
<i>Accipiter novaehollandiae</i>	grey goshawk	-	Endangered
<i>Prototroctes maraena</i>	Australian grayling	Vulnerable	Vulnerable
<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle	-	Vulnerable
<i>Botaurus poiciloptilus</i>	Australasian bittern	Endangered	-

4.2 Field Survey Results

4.2.1 Survey Timing and Climatic Conditions

Field surveys were undertaken on the 4th of December 2018. At the time of survey, weather conditions were fine and warm, with day time temperature of 26°C, and preceding night temperatures of 11°C, which are optimal early summer survey conditions.

4.2.2 Study Area Characteristics

The Study Area occurs in a highly modified landscape. On the southern bank of the North Esk River, a flood levee has been constructed to protect the Launceston urban areas during flood events. On the riverside of the levee, the Launceston Rowing Club has been constructed and includes a boat launching jetty on the northern side of the proposed cycle-way bridge (**Plate 1**). To the west of the proposed cycle-way bridge, the concrete floor/ footings of the old Launceston rowing club house occurs (**Plate 2**).

On the northern bank of the North Esk River, the U TAS Campus has been constructed (**Plate 3**) within the more extensive Inveresk Development Precinct. Between the main campus building and the river, an elevated concrete cycle way/footpath situated on top of a concrete levee follows the bank of the North Esk River (**Plate 3 and 4**).

The site inspection identified the presence of hydrosols within the Study Area. These soils are grey in colour. This confirms the presence of the mapped information, and the potential for disturbance of these soils to generate acid should they be excavated and the excavated material allowed to dry.



Plate 1 Looking west towards the rowing club and pontoon from eastern end of Study Area on the southern bank of the North Esk River



Plate 2 View from southern bank of North Esk River overlooking old rowing club house foundations.



Plate 3 View from central section of Study Area from the southern bank of the North Esk River looking across to the UTAS Campus and the existing foreshore pedestrian/cycleway



Plate 4 View west along the north bank of the North Esk River from the existing pedestrian access over the foreshore pedestrian-cycleway fronting the UTAS Campus

4.2.3 Vegetation Associations

The vegetation on both banks of the North Esk River within the Study Area consists of disturbed, weed infested riparian vegetation. Historic clearing associated with construction of the Launceston Flood Levee on the southern bank of the river and disturbance associated with the land development of the Inveresk Precinct containing the adjacent UTAS campus on the northern bank together with historic urban development in these areas has resulted in the highly disturbed riparian vegetation.

This disturbed riparian vegetation is described below.

Trees: Community dominated by the presence of the introduced scattered occurrences of Crack Willow (*Salix alba X fragilis*) occurring as a low tree to 3 m in height.

Shrubs: Shrub species dominated by introduced New Zealand flax (*Phormium tenax*), wild radish (*Raphanus raphanistrum*), and a dense lower cover of the native common reed (*Phragmites australis*) to a height of 1.5 m.

Groundcovers: Various ground covers and twining plants were identified throughout the Study Area. This layer is dominated by introduced species including morning glory (*Calystegia silvatica*), bindweed (*Convolvulus arvensis*), and blackberry (*Rubus fruticosus*) and occasional grass species including rough poa tussock (*Poa labillardieri*) and slender oat (*Avena barbata*) and herbs such as dandelion (*Taraxacum officinale*) to a height of 0.5 m.

The vegetation described above from the data collected during the field survey, confirms the mapping prepared under TASVEG 3.0 prepared by DPIPW (2018).

4.2.4 Conservation Significant Vegetation Associations

No Commonwealth TECs as identified within the EPBC Act were found to occur within the Study Area. Further to this, no State listed TECs were identified during the field survey of the Study Area.

4.2.5 Habitats

The high levels of disturbance associated with the Study Area have reduced available habitats to weed infested vegetation fringing the North Esk River and man-made structures used for perching of estuarine bird species. No habitat trees, logs, natural caves or crevices were identified during the field survey.

4.2.6 Species Diversity

4.2.6.1 Flora Species

In total, 29 flora species from 18 flora families and 28 genera were detected within the Study Area. The dominant number of species was from Poaceae with eight species detected, and the next dominant was four species from Asteraceae.

It is of note that 24 species of introduced flora were identified within the Study Area. This is indicative of the high levels of historic and on-going disturbance associated with adjoining urban land uses present both within and adjacent to the Study Area.

The species identified during the field survey of the Study Area are presented in **Table 4.4**.

Table 4.4 Flora Identified within the Study Area

Family	Scientific Name	Common Name
Araceae	<i>Zantedeschia aethiopica</i> *	arum lily
Araliaceae	<i>Hedera helix</i> *	ivy
Asphodelaceae	<i>Phormium tenax</i> *	New Zealand flax
Asteraceae	<i>Taraxacum officinale</i> *	dandelion
Asteraceae	<i>Hypochaeris radicata</i> *	rough catsear
Asteraceae	<i>Lactuca saligna</i> *	willow lettuce
<u>Asteraceae</u>	<i>Erigeron bonariense</i> *	flaxleaf fleabane
Boraginaceae	<i>Echium plantagineum</i> *	Paterson's curse
Brassicaceae	<i>Raphanus raphanistrum</i> *	wild radish
Convolvulaceae	<i>Calystegia silvatica</i> *	great bindweed
Convolvulaceae	<i>Convolvulus arvensis</i> *	field bindweed
Euphorbiaceae	<i>Euphorbia helioscopia</i> *	sun spurge

Family	Scientific Name	Common Name
Juncaceae	<i>Juncus pauciflorus</i>	common sedge
Juncaginaceae	<i>Triglochin procerum</i>	greater water ribbons
Plantaginaceae	<i>Plantago lanceolata</i> *	ribwort plantain
Poaceae	<i>Phragmites australis</i>	southern reed
Poaceae	<i>Spartina anglica</i> *	common cordgrass
Poaceae	<i>Poa labillardierei</i>	blue tussockgrass
Poaceae	<i>Avena barbata</i> *	bearded oat
Poaceae	<i>Cynodon dactylon</i> var. <i>dactylon</i> *	couchgrass
Poaceae	<i>Paspalum dilatatum</i> *	paspalum
Poaceae	<i>Pennisetum clandestinum</i> *	kikuyu grass
Poaceae	<i>Setaria verticillata</i> *	whorled pigeongrass
Polygonaceae	<i>Persicaria hydropiper</i>	green water-pepper
Primulaceae	<i>Lysimachia arvensis</i> *	scarlet pimpernel
Rosaceae	<i>Rubus fruticosus</i> *	blackberry
Salicaceae	<i>Salix alba X fragilis</i> *	crack willow
Solanaceae	<i>Solanum nigrum</i> *	blackberry nightshade
Verbenaceae	<i>Verbena officinalis</i> *	common verbena

* Introduced species

4.2.6.2 Fauna

In total, 8 fauna species were detected within the Study Area at the time of survey. The dominant fauna group consisted of bird species with a total of 7 species detected. One reptile species was observed within the rocky areas adjacent to the old rowing club foundations.

Due to the absence of suitable habitats, no other faunal groups are anticipated to occur within the Study Area. Those species found during the field survey are presented in **Table 4.5**.

Table 4.5 Fauna Species Recorded During Field Survey

Faunal Group	Scientific Name	Common Name
Birds	<i>Anas platyrhynchos</i>	Mallard
	<i>Anas castanea</i>	Chestnut Teal

Faunal Group	Scientific Name	Common Name
	<i>Anas superciliosa</i>	Pacific Black Duck
	<i>Porphyrio porphyrio</i>	Purple Swamphen
	<i>Acrocephalus australis</i>	Australian reed warbler
	<i>Anhinga melanogaster</i>	Australian Darter
	<i>Aythya australis</i>	Hardhead
Reptiles	<i>Niveoscincus metallicus</i>	Metallic Cool-Skink

None of these species are listed as threatened or migratory. While the Australian reed warbler is listed as a marine species under the EPBC Act, this listing only applies within Commonwealth marine areas and the Study Area does not occur within a Commonwealth marine area.

4.2.7 Weeds of Concern

Patersons Curse (*Echium plantagineum*), Blackberry (*Rubus fruticosus*) and Crack Willow (*Salix alba X fragilis*) were identified as occurring within the Study Area. These species are identified as Declared Weeds under the WM Act and are also identified as Weeds of National Significance (WoNS) and as a consequence a site specific Weed Management Plan should be developed to ensure these weeds are controlled within the Study Area, and that they are not spread from the Study Area once construction equipment is no longer required.

Review of the Tamar Valley Weed Strategy (Weed Strategy Working Group, 2019)¹, should be undertaken to ensure appropriate control measures are implemented.

¹ <http://www.weeds.asn.au/>

5.0 Potential Impacts

5.1 Vegetation Clearing

No TECs identified under the Commonwealth EPBC Act or under the Tasmanian NC Act were identified in the Study Area. Weed Infested fringing riparian vegetation was found to be present along both banks of the Study Area.

5.2 Threatened Flora

No threatened flora species listed under either the EPBC Act or the Tasmanian TSP Act were identified as occurring within the Study Area. Due to the localised nature of the disturbance proposed, and the proposed mitigation measures to be implemented to reduce sedimentation and erosion from the construction area, no impacts on any threatened flora species occurring in the wider receiving environment are anticipated to occur.

5.3 Terrestrial Threatened Fauna

Four threatened fauna species were identified as having potential to occur within the Study Area as part of a broader home range (**Appendix D**). These are:

- Tasmanian wedge-tailed eagle (*Aquila audax fleayi*)
- grey goshawk (*Accipiter novaehollandiae*)
- white-bellied sea-eagle (*Haliaeetus leucogaster*)
- Australasian bittern (*Botaurus poiciloptilus*).

No trees suitable for nesting or roosting purposes were identified within the Study Area for the Tasmanian wedge-tailed eagle, grey goshawk or white-bellied sea-eagle. While these species have potential to forage over the locality, due to the highly disturbed habitats present in the Study Area, together with the high levels of disturbance surrounding the Study Area, it is unlikely that these three species would be dependent upon the available habitats in the Study Area.

The Australasian Bittern is a large, heron-like bird found in shallow and vegetated freshwater or brackish swamps. According to the Threatened Species Section (2019b), the bird can be very difficult to detect due to its camouflage-coloured plumage (it's streaked and scalloped feathers blend in perfectly with background reedy vegetation); birds are also known to freeze if approached, and on windy days may even sway to match the movement of the vegetation. Due to the high levels of disturbance associated with the adjacent commercial activities in Launceston and the UTAS campus site there is a low likelihood that this species would occur in the narrow bands of habitat along the banks of the river. The proposed development is not anticipated to result in any significant impact upon this species. Short-term impacts associated with construction will be restricted to an area of approximately 0.25 ha consisting of highly disturbed marginal habitat for this species. Large areas of adjacent riparian habitat will be available for this species during the construction period. Due to its high mobility, the proposed development is not considered likely to represent any form of barrier to the movement of this species.

An assessment of significance, prepared in accordance with the Commonwealth's Impact Assessment Guidelines Version 1.1 (Department of Environment, 2013) has been prepared for the Tasmanian Wedge-tailed Eagle and the Australasian Bittern and is provided in **Appendix E**.

5.4 Aquatic Threatened Fauna

One threatened fish species, the Australian Grayling (*Prototroctes maraena*), has been recorded in the upper freshwater sections of the North Esk River. This species is known to migrate between fresh and marine waters. Adults live and breed in freshwater rivers, and the larvae are swept downstream into coastal waters. Juveniles then remain in marine waters for approximately six months before returning to the freshwater adult habitat (Threatened Species Section, 2019).

Little is known of the population size of the species in Tasmania, but it is believed that the species' range has contracted substantially in recent years (Bryant *et al*, 1999). The major threat to this species is the construction of barriers to fish movement which prevent adults migrating upstream and larvae moving downstream.

The proposed construction of a pedestrian-cycleway bridge is considered unlikely to result in any impacts upon this species. It is proposed to utilise sediment curtains around each pylon location during construction works within the North Esk River channel, together with the use of sedimentation and erosion control measures on each bank of the North Esk River where construction activities will be undertaken. Should fish migrate during construction activities, no barriers are proposed to block the North Esk River, ensuring free passage of fish.

An assessment of significance, prepared in accordance with the *Commonwealth's Impact Assessment Guidelines Version 1.1* (Department of Environment 2013) has been prepared for the Australian Grayling and is provided in **Appendix E**.

5.5 Weed Control

Due to the occurrence of Declared Weed species within the Study Area, a Weed Management Plan should be developed in accordance with the Tamar Valley Weed Strategy (to ensure these species are not dispersed as a result of the proposed development. It is recommended that provisions within the Weed Management Plan be developed to control declared weeds prior to construction activities commencing. Further to this, construction vehicles should be inspected washed down if required prior to leaving the site, to ensure soil material potentially containing seeds of these species does not leave the site. The weed management plan should also contain provisions following construction activities to monitor and control and declared weed species that respond to the disturbed conditions.

6.0 Planning Scheme Requirements

6.1 Environmental Management Zone

The banks of the North Esk River are Public Reserve under the *Crown Lands Act 1976*. The bed of the river is designated as the 'Tamar Conservation Area' under the NC Act. It is unknown whether a Reserve Activities Assessment is being prepared or if the relevant Minister has granted approval to satisfy the Acceptable Solution. In order to allow assessment against the Performance Criteria, if required, the following criteria from P1 are addressed in **Table 6.1**.

Table 6.1 Consideration of P1 Performance Criteria

Performance Criteria	Comment
P1 Use is consistent with the ecological, scientific, cultural or aesthetic values of the land, having regard to:	
(a) the significance of the ecological, scientific, cultural or aesthetic values;	Due to the high level of disturbance observed in the Study Area, and the low level of impact proposed (provided mitigation measures including sedimentation and erosion management are implemented), the proposed development will have a negligible negative impact on the ecological values of the Study Area.
(b) the protection, conservation, and management of the values;	The proposed development will be limited to disturbance of approximately 0.25 ha of low quality vegetation on modified banks of the North Esk River. Management plans to mitigate risks associated with erosion, siltation and sedimentation are recommended to be prepared and implemented prior to construction activities commencing. A weed management plan is also recommended to prevent the propagation of 'Declared' and environmental weeds on and adjacent to the Study Area.
(i) the measures to minimise or mitigate impacts;	It is recommended that an Erosion and Sedimentation Control Plan be developed for the project to mitigate sedimentation issues or siltation impacts associated with the proposed development. Due to the presence of declared and environmental weeds, a weed management plan is also recommended to mitigate the potential spread of these weeds species from the Study Area.

6.2 Biodiversity Code

The Biodiversity Codes applies to use or development of land:

- (a) *shown as priority habitat on the planning scheme overlay maps; or*
- (b) *identified in a flora and fauna report prepared by a suitably qualified person, that is lodged with an application for a permit or required in response to a request under section 54 of the Act, which identifies that the removal of native vegetation will have a significant impact on priority vegetation communities.*

Priority vegetation communities are defined in the code as “threatened vegetation and important habitat for threatened species that are listed under the Threatened Species Protection Act 1995 or the Environment Protection and Biodiversity Conservation Act (Commonwealth)”.

The site was not found to contain any threatened vegetation or important habitat. It does however include some areas mapped as Priority Habitat and as such this code is applicable.

Clause E8.6.1 Habitat and vegetation management applies to development within areas mapped as Priority Habitat. The objective of the clause is *“To appropriately protect or manage vegetation identified as priority habitat and priority vegetation communities”*. The Acceptable Solution for achievement of this objective is that clearance or disturbance of Priority Habitat is in accordance with a certified Forest Practices Plan. There is no Forest Practices Plan for the proposed development and as such the proposal relies upon Performance Criteria. These are addressed in the **Table 6.2**.

Table 6.2 Consideration of Performance Criteria

Performance Criteria	Comment
P1 Clearance or disturbance of native vegetation within priority habitat or areas identified as priority vegetation communities does not compromise the adequacy of representation of species or vegetation communities, having regard to:	
(a) the quality of the site to provide habitat of significance to the maintenance or protection of biodiversity in the planning scheme area;	The banks of the North Esk River in the area proposed for the pedestrian-cycleway consists of degraded weed infested riparian vegetation. This area is not considered significant with respect to the maintenance or protection of biodiversity in the planning scheme area.
(b) the need for the clearance or disturbance of the vegetation;	Vegetation clearing will be restricted to predominantly weed infested river bank areas. Clearing of this area will not impact upon any native vegetation communities.
(c) the method of clearance or disturbance of the vegetation;	Vegetation will be cleared using an excavator. The extent of clearance will be defined prior to work to minimise disturbance.
(d) the extent and quality of the vegetation or habitats affected by the proposal;	The proposal development will impact predominantly weed infested disturbed areas on the banks of the North Esk River. It is anticipated that only 0.25 ha of disturbance will occur as a result of the proposed development.
(e) the value of the vegetation as a wildlife corridor;	Based upon the assessment undertaken within the Flora and Fauna report, the riparian habitats associated with the North Esk River within the Study Area represent habitat for primarily common waterbird species. This group of species is highly mobile and as a consequence, habitat disturbance will be short term, and is unlikely to impact avian species that utilise this area. Due to the high levels of disturbance present in the Study Area, no other terrestrial faunal groups are anticipated to be potentially impacted. As disturbance to the water way will involve the installation of a pylon within the channel, these works are not anticipated to impact upon the Australian Grayling and its potential

Performance Criteria	Comment
	movement along this waterway.
(f) the value of riparian vegetation to the protection of habitats and wildlife corridors;	As the proposed development consists of a pedestrian-cycleway bridge, clearing will be restricted to the piers and access points of the bridge. The vegetation present within the Study Area is highly disturbed, and dominated by various introduced weed species. As a consequence, it is considered that the riparian vegetation represents low value with respect to protection of habitats and wildlife corridors.
(g) any rehabilitation and maintenance measures;	The development will be managed in accordance with a CEMP which will ensure disturbed areas are rehabilitated and maintained to ensure the long term stability of the development area.
(h) the impacts of development and vegetation clearance, in proximity to the priority habitat or priority vegetation communities;	The North Esk River has been identified as a Priority Habitat Area. It is anticipated that the impacts of the proposed pedestrian-cycleway bridge construction will predominantly be restricted to the historically cleared/disturbed areas. Sediment curtains are proposed to be used around the location of each proposed in-river pylon to be constructed in the waterway, and sedimentation and erosion control measures will be implemented during construction associated with the bridge ends. These measures will be implemented prior to and during construction to minimise any detrimental impacts upon the Priority Habitat Area.
(i) any conservation outcomes achieved and the long term security of any offset for the loss of the vegetation, provided in accordance with the General Offset Principles document published by the Department of Primary Industries, Parks, Water and Environment, available at http://dpi.pwe.tas.gov.au/Documents/General-Offset-Principles.pdf ;	Limited clearing of highly disturbed vegetation will be undertaken as a result of the proposed development. No TECs or threatened species will be impacted by the proposed development.
(j) any agreement under section 71 of the Act relating to vegetation management;	No agreements have been made relating to vegetation management.
(k) any conservation covenant made under the <u>Nature Conservation Act 2002</u> , that exists on or adjacent to the site of the proposed development; and	No conservation covenants have been made under the NC Act that exists on or adjacent to the site of the proposed development.
(l) any recommendations or advice contained in a flora and fauna report.	Silt curtains to reduce silt impacts from construction of piles for the bridge. Bank sedimentation and erosion control devices to be implemented on the banks of the North Esk River in accordance with the Wetlands and Waterway Works Manual. Weed management should be undertaken in accordance with a site specific Weed Management Plan to prevent the spread or propagation of weeds on and adjacent to the Study Area.

6.3 Water Quality Code

The Water Quality Code applies to use or development of land:

- (a) within a wetland or watercourse; or
- (b) located within 30 m of a wetland or watercourse; or
- (c) which discharges stormwater or wastewater to land within 30 m of a watercourse or wetland.

Performance Criteria: To protect watercourses and wetlands from the effects of development and minimise the potential for water quality degradation.

Performance Criteria	Comment
P1 Development must not unreasonably impact the water quality of watercourses or wetlands, having regard to:	
(a) the topography of the site;	The Study Area occurs on the floodplain of the North Esk River. A man made flood levee occurs on the southern and northern banks of the North Esk River, representing an approximate 2 m rise in the topography in this location. The proposed construction of a pedestrian-cycleway bridge is considered unlikely to impact the water quality having regard to the disturbed nature of the topography in this location.
(b) the potential for erosion	Hydrosol soils are considered to have low potential for erosion. Construction is expected to be restricted to small areas, will have sedimentation control devices installed prior to construction activities commencing, and any disturbed areas will be rehabilitated following construction, and managed until stabilisation has been achieved to eliminate the potential for erosion to impact the North Esk River. Further or refined mitigation measures should be implemented in accordance with a project specific geotechnical investigation to be prepared by Pitt and Sherry Pty Ltd.
(c) the potential for siltation and sedimentation;	Sedimentation and erosion control measures will be implemented prior to construction. Measures proposed for implementation include installation of sediment fencing between construction areas and the high water mark of the North Esk River. During construction of the pylon, siltation curtains will be installed around the location of the pylon to eliminate sediment disturbance, and adjacent upstream or downstream siltation. Provide the recommended measures are implemented, there is considered low potential for siltation and sedimentation to impact the North Esk River.
(d) the risk of flood;	Pitt and Sherry Pty Ltd to address this criteria.
(e) the impact of the removal of vegetation on hydrology;	Pitt and Sherry Pty Ltd to address this criteria.
(f) the natural values of the vegetation and the land;	The land within the Study Area consists of historically disturbed vegetation communities associated with the construction of the Inveresk Precinct and the works associated with the Launceston Rowing Club and the flood levee. These high levels of disturbance have also decreased the resultant fauna habitat values of the Study Area.

Performance Criteria	Comment
(g) the scale of the development;	The scale of development is expected to be minimal with respect to ground disturbance. Concept plans indicate that excavations to an approximate depths of 1 m will occur on the southern bank of the North Esk River over an area of 50 m ² , representing the entry to the south end of the proposed bridge. One pylon will be installed within the river channel, to provide structural support for the proposed bridge.
(h) the method of works, including vegetation removal, and the machinery used;	It is anticipated that work areas will consist of excavation areas for the southern entry to the proposed bridge, and proposed construction material laydown areas and vehicle parking. It is anticipated that excavations will be undertaken using a backhoe, within the identified areas specified in Section 1.2 of this report. A barge will used for the installation/construction of the in stream pylon.
(i) any measures to mitigate impacts;	Sedimentation and erosion control measures will be implemented in accordance with the Department of Primary Industries, Parks, Water and Environment Wetlands and Waterways Works Manual.
(j) any remediation measures proposed;	Weed management will be undertaken prior to construction and will involve on-going monitoring until the site has been successfully rehabilitated. Remediation of construction areas will involve the stabilisation of disturbed areas following construction through armoring which may include rock revetment or appropriate vegetative cover. These remediation measures will be addressed in detail within the Construction Environmental Management Plan to be prepared for the site.
(k) any soil and water management plan; and	Control measures will be implemented via a Construction Environmental Management Plan. This Plan will be prepared in accordance with the Department of Primary Industries, Parks, Water and Environment Wetlands and Waterways Works Manual.
(l) the requirements of the Department of Primary Industries, Parks, Water and Environment Wetlands and Waterways Works Manual.	The requirements as stated within the Department of Primary Industries, Parks, Water and Environment Wetlands and Waterways Works Manual will be implemented within the proposed Construction Environmental Management Plan for the site, specifically with respect to erosion, sedimentation and works within a watercourse.

7.0 Management and Mitigation

No direct impacts are anticipated on threatened flora, fauna or ecological communities. However, there is potential for indirect impacts to occur as a result of this proposed development includes the following:

- clearance of existing disturbed fringing vegetation resulting in potential erosion and sedimentation associated with bank earth works and potential siltation as a result of construction of one in channel pylon; and
- potential for 'Declared' weeds present within the Study Area being spread or allowed to increase in density due to their propensity to exploit disturbed areas.

It is anticipated that these two impacts will be mitigated through the development of a project specific CEMP. Recommendations for information to be included within the CEMP to address the identified impacts are detailed in the following sections.

7.1 Erosion and Sedimentation Control

In accordance with the Wetland and Waterway Works Manual (DPIPWE 2019c), the following aspects will need to be addressed within a project specific Erosion and Sedimentation Control Plan:

- Prior to works commencing, it is recommended that erosion and sedimentation measures be installed between proposed construction areas and the North Esk River;
- Maintain the natural flow regime of the river by avoiding or minimising changes to the channel form and flow volume;
- Minimise disturbance to streambank soil and vegetation; and
- Monitor effectiveness of erosion and sedimentation controls during construction and following site remediation for a period of five years.

It is recommended that siltation curtains be utilised during construction of the in channel pylon for the proposed bridge. This will mitigate impacts associated with siltation impacting water quality in proximity to the proposed bridge. Silt curtains should be left in place following construction until sediment levels have dropped to ambient levels in the wider North Esk River.

7.2 Weed Management

A Weed Management Plan should be developed to control 'declared' and environmental weeds throughout the works area, in accordance with the Tamar Valley Weed Strategy (Weed Strategy Working Group, 2018).

Specifically this plan should:

- Plan for targeted pre-works control to reduce propagule pressure during works
- Ensure excavated soil from weed affected areas is not spread to weed free areas and preferably buried beneath 500 mm of fill
- Include prescriptions for weed hygiene during construction activities

Allow for targeted weed treatment on completion of works and during follow-up monitoring. This should include an annual weed control audit of the site for up to five years following construction completion, to specifically target weeds that have exploited the disturbance associated with the construction activities.

8.0 Conclusions

8.1 Vegetation

The vegetation along the banks of the North Esk River consists of highly disturbed fringing vegetation. No Threatened Ecological Communities identified under either the Commonwealth EPBC Act, or the Tasmanian NC Act was recorded in the Study Area.

8.2 Threatened Flora

No threatened flora species as listed under either the Commonwealth EPBC Act or the Tasmanian TSP Act were recorded within the Study Area. Assessment of available habitats as determined during the field survey indicates that due to historic disturbance associated with the existing urban landscape of the Study Area, threatened flora species are considered unlikely to occur.

8.3 Threatened Fauna

No threatened fauna listed under either the EPBC Act or the TSP Act were recorded within the Study Area, following targeted field surveys. The proposed development will not impact any critical habitat elements for any threatened species identified as having potential to occur including the Tasmanian Wedge-tailed Eagle, Grey Goshawk, White Bellied Sea-eagle, Australasian Bittern or the fish species Australian Grayling, to the point that proposed development will impact the persistence of these threatened species within the locality.

Various mitigation measures are proposed within **Section 7.0** of this report to minimise erosion; sedimentation and siltation do not impact upon the fringing habitats or aquatic habitats adjacent to the construction area associated with the North Esk River. These mitigation measures are proposed to be detailed within a project specific Construction Environmental Management Plan and will protect habitats for native species with known to occur in this area.

8.4 Weeds

Three declared weeds were identified within the Study Area (crack willow, Paterson's curse and blackberry). It is recommended that a weed management plan be developed in accordance with the Tamar Valley Weed Strategy (Weed Strategy Working Group, 2018) to treat these weed species prior to construction activities commencing. Further to this, measures should be implemented to ensure weeds are not spread from the site during construction, and that appropriate monitoring and control measures are implemented following construction to ensure the site is sustainably rehabilitated.

8.5 Implications

Provided the recommended mitigation measures are implemented, the proposed development will not result in any significant impacts to any Commonwealth listed flora, fauna or ecological community identified under the EPBC Act. Further to this, no significant impacts are expected to result on any Tasmanian species listed under the TSP Act requiring a permit under this Act.

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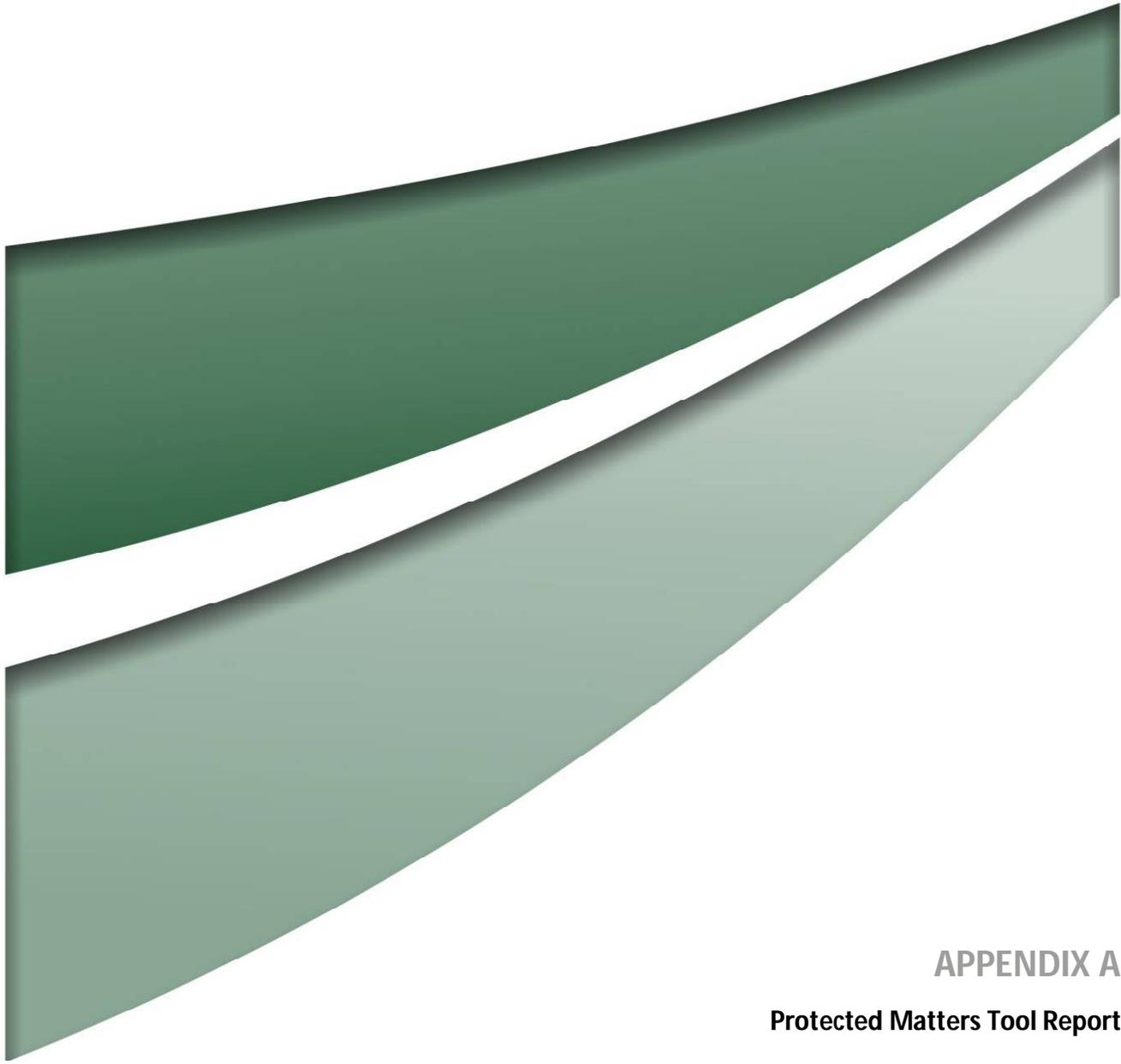
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APPENDIX A
Protected Matters Tool Report



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

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[Summary](#)

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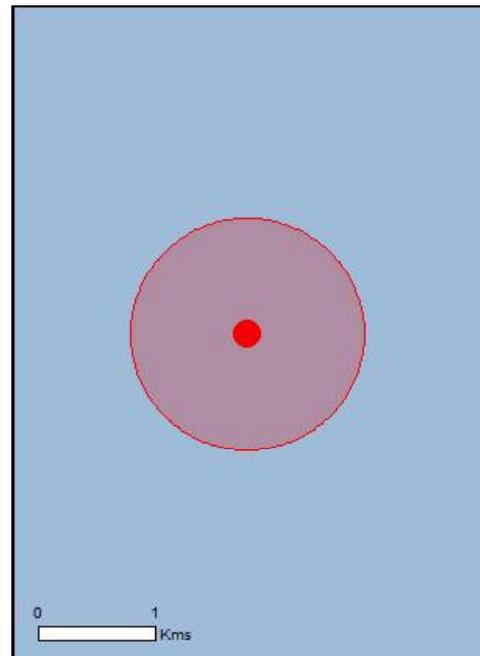
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[Extra Information](#)

[Caveat](#)

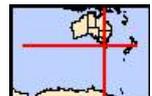
[Acknowledgements](#)



This map may contain data which are
©Commonwealth of Australia
(Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 1.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	42
Listed Migratory Species:	26

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	2
Listed Marine Species:	32
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	1
Invasive Species:	26
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Species or species habitat likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel	Endangered	Species or species



Name
[1060]

Status

Type of Presence

habitat likely to occur within area

[Macronectes halli](#)

Northern Giant Petrel [1061]

Vulnerable

Species or species habitat may occur within area

[Numenius madagascariensis](#)

Eastern Curlew, Far Eastern Curlew [847]

Critically Endangered

Species or species habitat may occur within area

[Pachyptila turtur subantarctica](#)

Fairy Prion (southern) [64445]

Vulnerable

Species or species habitat likely to occur within area

[Pterodroma leucoptera leucoptera](#)

Gould's Petrel, Australian Gould's Petrel [26033]

Endangered

Species or species habitat may occur within area

[Thalassarche bulleri](#)

Buller's Albatross, Pacific Albatross [64460]

Vulnerable

Species or species habitat may occur within area

[Thalassarche bulleri platei](#)

Northern Buller's Albatross, Pacific Albatross [82273]

Vulnerable

Species or species habitat may occur within area

[Thalassarche cauta cauta](#)

Shy Albatross, Tasmanian Shy Albatross [82345]

Vulnerable

Species or species habitat likely to occur within area

[Thalassarche cauta steadi](#)

White-capped Albatross [82344]

Vulnerable

Species or species habitat likely to occur within area

[Thalassarche chrysostoma](#)

Grey-headed Albatross [66491]

Endangered

Species or species habitat may occur within area

[Thalassarche impavida](#)

Campbell Albatross, Campbell Black-browed Albatross [64459]

Vulnerable

Species or species habitat likely to occur within area

[Thalassarche melanophris](#)

Black-browed Albatross [66472]

Vulnerable

Species or species habitat likely to occur within area

[Thalassarche salvini](#)

Salvin's Albatross [64463]

Vulnerable

Species or species habitat likely to occur within area

[Tyto novaehollandiae castanops \(Tasmanian population\)](#)

Masked Owl (Tasmanian) [67051]

Vulnerable

Breeding known to occur within area

Crustaceans

[Engaeus orramakunna](#)

Mount Arthur Burrowing Crayfish [66778]

Vulnerable

Species or species habitat may occur within area

Fish

[Prototroctes maraena](#)

Australian Grayling [26179]

Vulnerable

Species or species habitat known to occur within area

Frogs

[Litoria raniformis](#)

Growing Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]

Vulnerable

Species or species habitat known to occur within area

Mammals

[Dasyurus maculatus maculatus \(Tasmanian population\)](#)

Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]

Vulnerable

Species or species habitat known to occur within area

Name	Status	Type of Presence
Dasyurus viverrinus Eastern Quoll, Luaner [333]	Endangered	Species or species habitat known to occur within area
Perameles gunnii gunnii Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat likely to occur within area
Sarcophilus harrisii Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area



Plants

Barbarea australis Native Wintercress, Riverbed Wintercress [12540]	Endangered	Species or species habitat likely to occur within area
Caladenia caudata Tailed Spider-orchid [17067]	Vulnerable	Species or species habitat known to occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat likely to occur within area
Epacris exserta South Esk Heath [19879]	Endangered	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercross, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat may occur within area
Pterostylis commutata Midland Greenhood [64535]	Critically Endangered	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area

Reptiles

Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
---	------------	--

Listed Migratory Species

[[Resource Information](#)]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Species or species habitat likely to occur within area
Migratory Marine Species		
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species





Name

Threatened

Type of Presence

[Gallinago hardwickii](#)

Latham's Snipe, Japanese Snipe [863]

habitat may occur within area

Species or species habitat may occur within area

[Limosa lapponica](#)

Bar-tailed Godwit [844]

Species or species habitat may occur within area

[Numenius madagascariensis](#)

Eastern Curlew, Far Eastern Curlew [847]

Critically Endangered

Species or species habitat may occur within area

[Tringa nebularia](#)

Common Greenshank, Greenshank [832]

Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land

[\[Resource Information \]](#)

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

Name

Defence - PATERSON BARRACKS - LAUNCESTON

Commonwealth Heritage Places

[\[Resource Information \]](#)

Name

State

Status

Historic

[Launceston General Post Office](#)

TAS

Listed place

[Paterson Barracks Commissariat Store](#)

TAS

Listed place

Listed Marine Species

[\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name

Threatened

Type of Presence

Birds

[Actitis hypoleucos](#)

Common Sandpiper [59309]

Species or species habitat known to occur within area

[Apus pacificus](#)

Fork-tailed Swift [678]

Species or species habitat likely to occur within area

[Ardea alba](#)

Great Egret, White Egret [59541]

Species or species habitat likely to occur within area

[Ardea ibis](#)

Cattle Egret [59542]

Species or species habitat may occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Species or species habitat known to occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat may occur within area

[Calidris melanotos](#)

Pectoral Sandpiper [858]

Species or species habitat may occur within area

[Diomedea antipodensis](#)

Antipodean Albatross [64458]

Vulnerable

Species or species



Name

Threatened

Type of Presence

habitat likely to occur within area

[Diomedea epomophora](#)

Southern Royal Albatross [89221]

Vulnerable

Species or species habitat likely to occur within area

[Diomedea exulans](#)

Wandering Albatross [89223]

Vulnerable

Species or species habitat likely to occur within area

[Diomedea gibsoni](#)

Gibson's Albatross [64466]

Vulnerable*

Species or species habitat likely to occur within area

[Diomedea sanfordi](#)

Northern Royal Albatross [64456]

Endangered

Species or species habitat likely to occur within area

[Gallinago hardwickii](#)

Latham's Snipe, Japanese Snipe [863]

Species or species habitat may occur within area

[Haliaeetus leucogaster](#)

White-bellied Sea-Eagle [943]

Species or species habitat known to occur within area

[Hirundapus caudacutus](#)

White-throated Needletail [682]

Species or species habitat known to occur within area

[Lathamus discolor](#)

Swift Parrot [744]

Critically Endangered

Species or species habitat known to occur within area

[Limosa lapponica](#)

Bar-tailed Godwit [844]

Species or species habitat may occur within area

[Macronectes giganteus](#)

Southern Giant-Petrel, Southern Giant Petrel [1060]

Endangered

Species or species habitat likely to occur within area

[Macronectes halli](#)

Northern Giant Petrel [1061]

Vulnerable

Species or species habitat may occur within area

[Myiagra cyanoleuca](#)

Satin Flycatcher [612]

Species or species habitat known to occur within area

[Numenius madagascariensis](#)

Eastern Curlew, Far Eastern Curlew [847]

Critically Endangered

Species or species habitat may occur within area

[Pachyptila turtur](#)

Fairy Prion [1066]

Species or species habitat likely to occur within area

[Thalassarche bulleri](#)

Buller's Albatross, Pacific Albatross [64460]

Vulnerable

Species or species habitat may occur within area

[Thalassarche cauta](#)

Tasmanian Shy Albatross [89224]

Vulnerable*

Species or species habitat likely to occur within area

[Thalassarche chrysostoma](#)

Grey-headed Albatross [66491]

Endangered

Species or species habitat may occur within area

[Thalassarche impavida](#)

Campbell Albatross, Campbell Black-browed Albatross [64459]

Vulnerable

Species or species habitat likely to occur

**Name**[Thalassarche melanophris](#)

Black-browed Albatross [66472]

Threatened

Vulnerable

Type of Presence

within area

Species or species habitat likely to occur within area

[Thalassarche salvini](#)

Salvin's Albatross [64463]

Vulnerable

Species or species habitat likely to occur within area

[Thalassarche sp. nov.](#)

Pacific Albatross [66511]

Vulnerable*

Species or species habitat may occur within area

[Thalassarche steadi](#)

White-capped Albatross [64462]

Vulnerable*

Species or species habitat likely to occur within area

[Tringa nebularia](#)

Common Greenshank, Greenshank [832]

Species or species habitat may occur within area

Reptiles[Chelonia mydas](#)

Green Turtle [1765]

Vulnerable

Species or species habitat may occur within area

Extra Information**State and Territory Reserves**[\[Resource Information \]](#)**Name****State**

Tamar

TAS

Regional Forest Agreements[\[Resource Information \]](#)

Note that all areas with completed RFAs have been included.

Name**State**[Tasmania RFA](#)

Tasmania

Invasive Species[\[Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name**Status****Type of Presence****Birds**

Alauda arvensis

Skylark [656]

Species or species habitat likely to occur within area

Anas platyrhynchos

Mallard [974]

Species or species habitat likely to occur within area

Carduelis carduelis

European Goldfinch [403]

Species or species habitat likely to occur within area

Carduelis chloris

European Greenfinch [404]

Species or species habitat likely to occur within area

Name	Status	Type of Presence
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur



Name

Status

Type of Presence
within area

Genista monspessulana

Montpellier Broom, Cape Broom, Canary Broom,
Common Broom, French Broom, Soft Broom [20126]

Species or species habitat
likely to occur within area

Rubus fruticosus aggregate

Blackberry, European Blackberry [68406]

Species or species habitat
likely to occur within area

Salix spp. except *S.babylonica*, *S.x calodendron* & *S.x reichardtii*

Willows except Weeping Willow, Pussy Willow and
Sterile Pussy Willow [68497]

Species or species habitat
likely to occur within area

Ulex europaeus

Gorse, Furze [7693]

Species or species habitat
likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-41.42972 147.14167

Acknowledgements

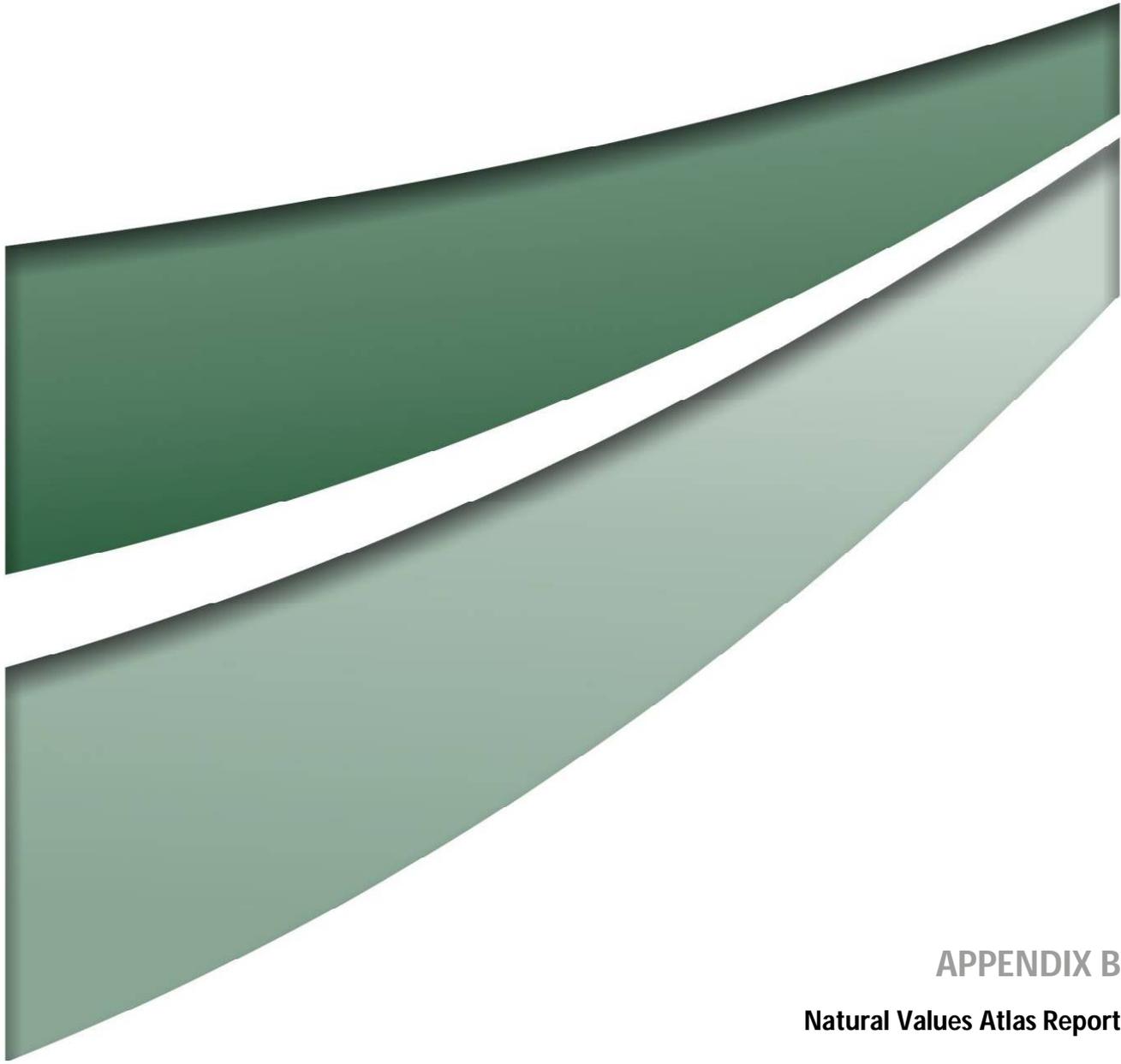
This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

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

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

Please feel free to provide feedback via the [Contact Us](#) page.

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APPENDIX B
Natural Values Atlas Report

Natural Values Atlas Report

Authoritative, comprehensive information on Tasmania's natural values.

Reference: bridge

Requested For: Invermay

Report Type: Summary Report

Timestamp: 03:39:08 PM Tuesday 11 December 2018

Threatened Flora: buffers Min: 500m Max: 5000m

Threatened Fauna: buffers Min: 500m Max: 5000m

Raptors: buffers Min: 500m Max: 5000m

Tasmanian Weed Management Act Weeds: buffers Min: 500m Max: 5000m

Priority Weeds: buffers Min: 500m Max: 5000m

Geoconservation: buffer 1000m

Acid Sulfate Soils: buffer 1000m

TASVEG: buffer 1000m

Threatened Communities: buffer 1000m

Fire History: buffer 1000m

Tasmanian Reserve Estate: buffer 1000m

Biosecurity Risks: buffer 1000m

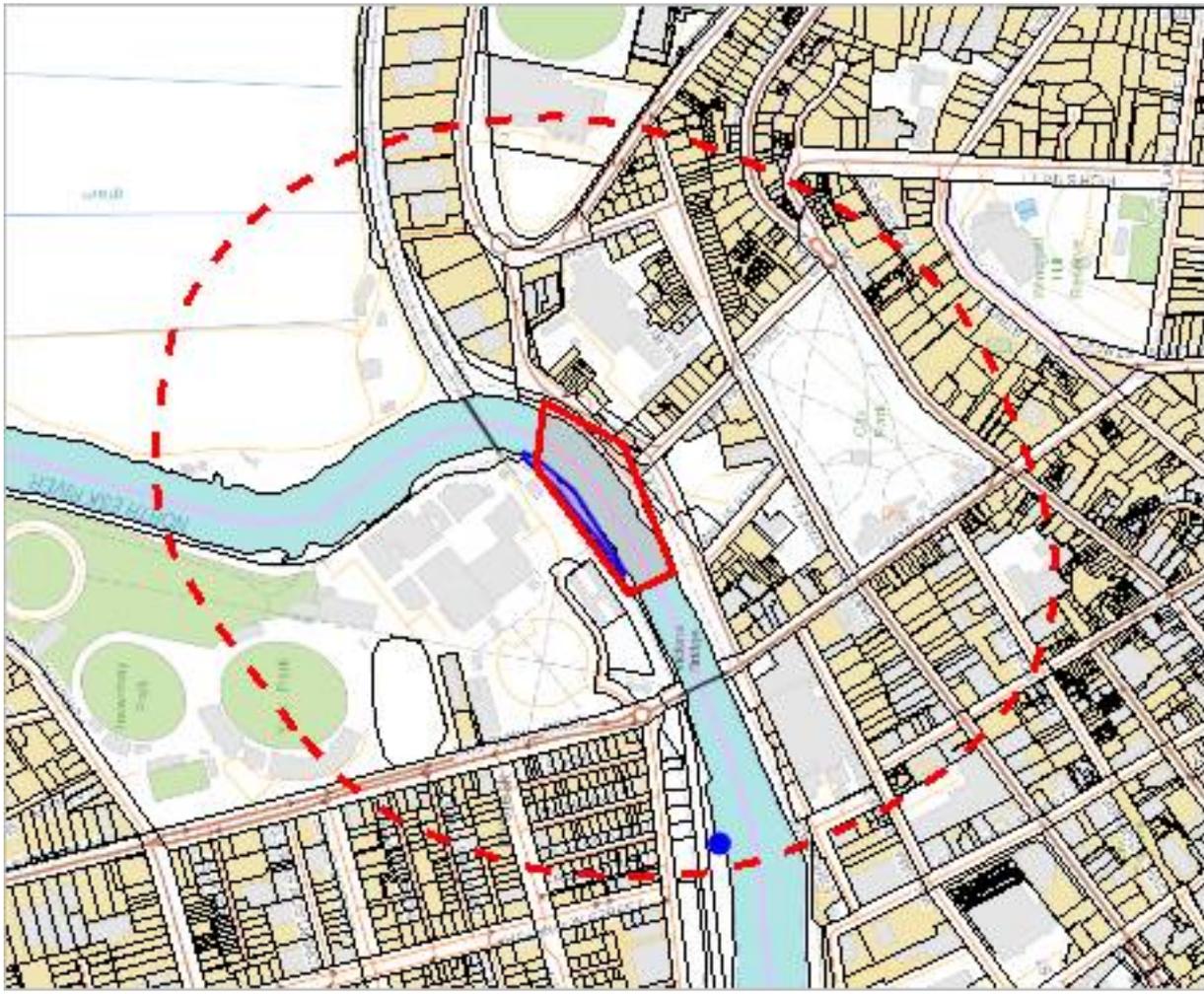


The centroid for this query GDA94: **511873.0, 5413534.0** falls within:

Property: 0

Threatened flora within 500 metres

512527, 5414320



511217, 5412741

Please note that some layers may not display at all requested map scales



Threatened flora within 500 metres

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

— Line Verified

— Line Unverified

■ Polygon Verified

■ Polygon Unverified

Legend: Cadastral Parcels





Threatened flora within 500 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Calystegia sepium	swamp bindweed	r		n	1	10-Jan-2017
Schoenoplectus tabernaemontani	river clubsedge	r		n	1	30-Mar-2000

Unverified Records

No unverified records were found!

For more information about threatened species, please contact Threatened Species Enquiries.

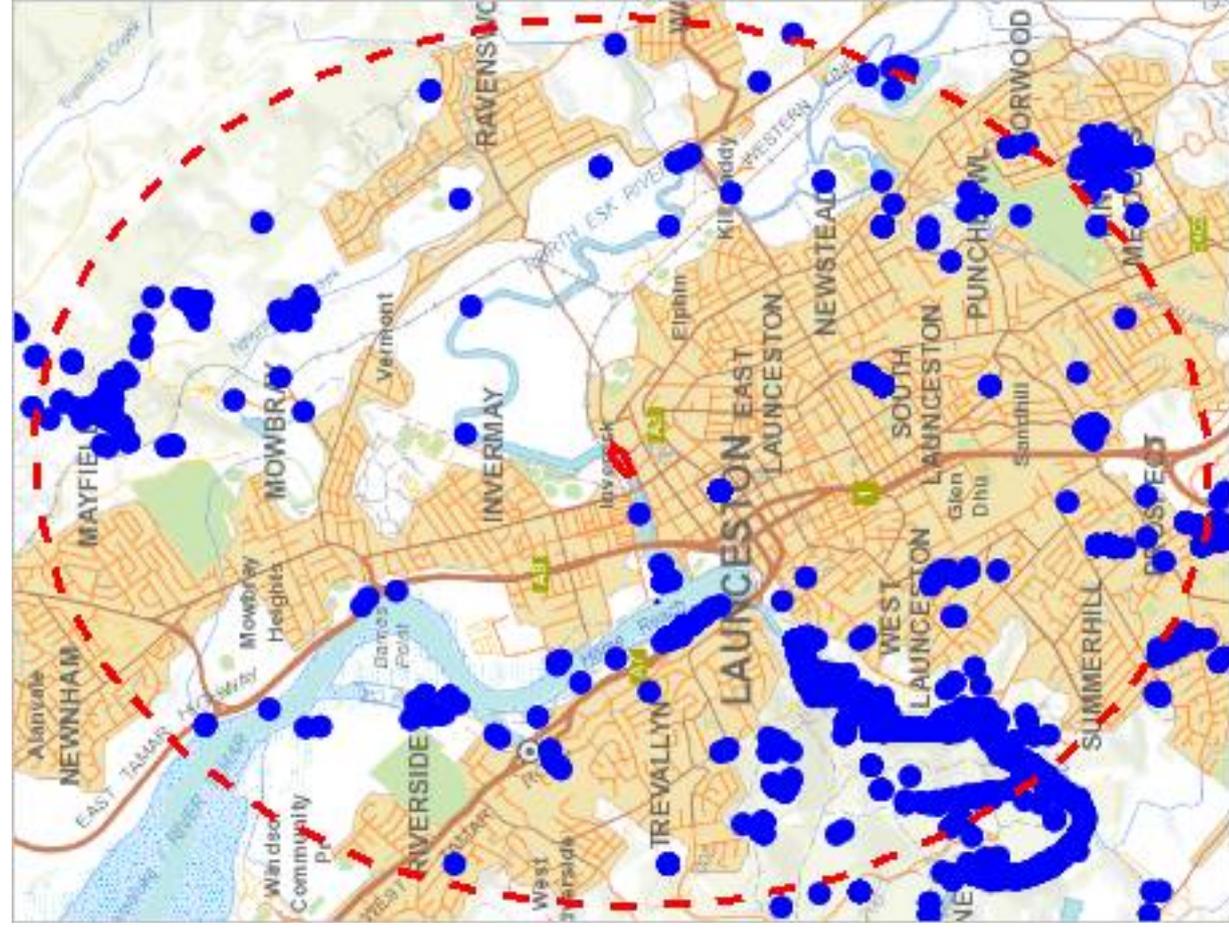
Telephone: 1300 368 550

Email: ThreatenedSpecies.Enquiries@dpiwve.tas.gov.au

Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Threatened flora within 5000 metres

515921, 5418813



507829, 5408247

Please note that some layers may not display at all requested map scales

PLANNING EXHIBITED DOCUMENTS
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Threatened flora within 5000 metres

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

— Line Verified

— Line Unverified

■ Polygon Verified

■ Polygon Unverified

Legend: Cadastral Parcels



Threatened flora within 5000 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
<i>Alternanthera denticulata</i>	lesser joyweed	e		n	434	15-Feb-2015
<i>Anogramma leptophylla</i>	annual fern	v		n	5	19-Oct-1984
<i>Aphelia gracilis</i>	slender fanwort	r		n	20	25-Oct-2017
<i>Aphelia pumilio</i>	dwarf fanwort	r		n	32	14-Nov-2018
<i>Asperula subsimplex</i>	water woodruff	r		n	1	30-Mar-2000
<i>Austrostipa bigeniculata</i>	doublejointed speargrass	r		n	1	17-Jun-1996
<i>Blechnum spinulosum</i>	small raspfern	e		n	24	26-Feb-2018
<i>Bolboschoenus caldwellii</i>	sea clubsedge	r		n	20	20-Jan-2010
<i>Boronia gunnii</i>	river boronia	v	VU	e	17	25-Oct-1961
<i>Brunonia australis</i>	blue pincushion	r		n	162	28-Nov-2018
<i>Caesia calliantha</i>	blue grasslily	r		n	54	22-Dec-2017
<i>Caladenia filamentosa</i>	daddy longlegs	r		n	3	29-Oct-1893
<i>Caladenia patersonii</i>	patersons spider-orchid	v		n	3	11-Oct-1991
<i>Callitris oblonga</i> subsp. <i>oblonga</i>	south esk pine	v	EN	e	17	19-Mar-2010
<i>Calocephalus lacteus</i>	milky beautyheads	r		n	1	24-Dec-1844
<i>Calochilus campestris</i>	copper beard-orchid	e		n	1	12-Nov-2012
<i>Calystegia sepium</i>	swamp bindweed	r		n	46	17-Feb-2017
<i>Carex gunniana</i>	mountain sedge	r		n	2	15-Dec-2009
<i>Carex longebrachiata</i>	drooping sedge	r		n	3	01-Sep-1992
<i>Centipeda cunninghamii</i>	erect sneezeweed	r		n	6	14-Feb-2018
<i>Damasonium minus</i>	starfruit	r		n	1	10-Apr-2000
<i>Deyeuxia lawrencei</i>	lawrences bentgrass	x	EX	ex	1	01-Jan-1831
<i>Dianella amoena</i>	grassland flaxlily	r	EN	n	6	16-Feb-2010
<i>Discaria pubescens</i>	spiky anchorplant	e		n	1	01-Jan-1912
<i>Diuris palustris</i>	swamp doubletail	e		n	3	01-Oct-1942
<i>Epacris exserta</i>	south esk heath	e	PEN	e	36	18-Mar-2010
<i>Epilobium pallidiflorum</i>	showy willowherb	r		n	3	12-Dec-2009
<i>Euphrasia collina</i> subsp. <i>deflexifolia</i>	eastern eyebright	r		e	1	31-Aug-1892
<i>Euphrasia scabra</i>	yellow eyebright	e		n	1	21-Nov-1887
<i>Gratiola pubescens</i>	hairy brooklime	v?r		n	2	11-Feb-2011
<i>Gynatrix pulchella</i>	fragrant hempbush	r		n	1	01-Oct-1994
<i>Gyrostemon thesioides</i>	broom wheelfruit	r		n	13	18-Nov-2011
<i>Haloragis heterophylla</i>	variable raspwort	r		n	22	14-Nov-2012
<i>Hovea tasmanica</i>	rockfield purplepea	r		e	7	07-Oct-2009
<i>Hypolepis muelleri</i>	harsh groundfern	r		n	1	10-Mar-1981
<i>Isoetes elatior</i>	tall quillwort	r		e	1	15-Mar-1842
<i>Juncus amabilis</i>	gentle rush	r?		n	18	18-Nov-2011
<i>Leucopogon virgatus</i> var. <i>brevifolius</i>	shortleaf beardheath	r		n	1	14-Oct-2013
<i>Lycopus australis</i>	australian gypsywort	e		n	16	15-Feb-2015
<i>Lythrum salicaria</i>	purple loosestrife	v		n	93	15-Feb-2015
<i>Mentha australis</i>	river mint	e		n	54	21-Feb-2013
<i>Muehlenbeckia axillaris</i>	matted lignum	r		n	1	02-Apr-1980
<i>Myriophyllum integrifolium</i>	tiny watermilfoil	v		n	1	18-Nov-1991
<i>Parietaria debilis</i>	shade pellitory	r		n	3	03-Nov-1992
<i>Persicaria decipiens</i>	slender waterpepper	v		n	66	30-Apr-2010
<i>Persicaria subsessilis</i>	bristly waterpepper	e		n	200	09-Mar-2017
<i>Phyllangium divergens</i>	wiry mitrewort	v		n	1	07-Nov-1949
<i>Pitularia novae-hollandiae</i>	australian pillwort	r		n	1	01-Jan-1990
<i>Pimelea flava</i> subsp. <i>flava</i>	yellow riceflower	r		n	1	01-Nov-1946
<i>Poa mollis</i>	soft tussockgrass	r		e	20	23-Jan-2017
<i>Prostanthera cuneata</i>	alpine mintbush	x		x	2	03-Feb-1840
<i>Prostanthera rotundifolia</i>	roundleaf mintbush	v		n	28	08-Oct-2009
<i>Pterostylis grandiflora</i>	superb greenhood	r		n	1	01-Jun-1951
<i>Pterostylis ziegeleri</i>	grassland greenhood	v	VU	e	3	01-Jan-1889
<i>Pultenaea prostrata</i>	silky bushpea	v		n	2	01-Nov-1921
<i>Ranunculus pumilio</i> var. <i>pumilio</i>	ferny buttercup	r		n	2	01-Jan-2000
<i>Rumex bidens</i>	mud dock	v		n	2	18-Jan-2009
<i>Rytidosperma indutum</i>	tall wallabygrass	r?		n	1	01-Nov-1984
<i>Schenkia australis</i>	spike centaury	r		n	1	01-Nov-1943
<i>Schoenoplectus tabernaemontani</i>	river clubsedge	r		n	6	14-Feb-2018
<i>Scleranthus fasciculatus</i>	spreading knawel	v		n	2	11-Sep-2017
<i>Scutellaria humilis</i>	dwarf skullcap	r		n	13	10-Dec-2010

Threatened flora within 5000 metres

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
<i>Senecio campylocarpus</i>	bulging fireweed	v		n	23	26-Feb-2018
<i>Senecio squarrosus</i>	leafy fireweed	r		n	19	30-Oct-2009
<i>Siloxerus multiflorus</i>	small wrinklewort	r		n	27	23-Oct-2012
<i>Spyridium eriocephalum</i> var. <i>eriocephalum</i>	heath dustymiller	e		n	4	20-Oct-1880
<i>Spyridium vexilliferum</i> var. <i>vexilliferum</i>	helicopter bush	r		n	12	07-Oct-2009
<i>Stylidium despectum</i>	small triggerplant	r		n	3	12-Oct-2015
<i>Tetradheca ciliata</i>	northern pinkbells	r		n	1	01-Jan-1896
<i>Teucrium corymbosum</i>	forest germander	r		n	19	08-Dec-2011
<i>Triptilodiscus pygmaeus</i>	dwarf sunray	v		n	3	08-Oct-2015
<i>Utricularia australis</i>	yellow bladderwort	r		n	7	05-Mar-2014
<i>Velleia paradoxa</i>	spur velleia	v		n	4	01-Sep-1992
<i>Veronica plebeia</i>	trailing speedwell	r		n	22	14-Nov-2018
<i>Viola caleyana</i>	swamp violet	r		n	1	18-Jan-1993
<i>Vittadinia gracilis</i>	woolly new-holland-daisy	r		n	2	01-Jan-1868
<i>Westringia angustifolia</i>	narrowleaf westringia	r		e	1	20-Nov-2003
<i>Xerochrysum bicolor</i>	eastcoast paperdaisy	r		n	8	25-Oct-1992

Unverified Records

No unverified records were found!



For more information about threatened species, please contact Threatened Species Enquiries.

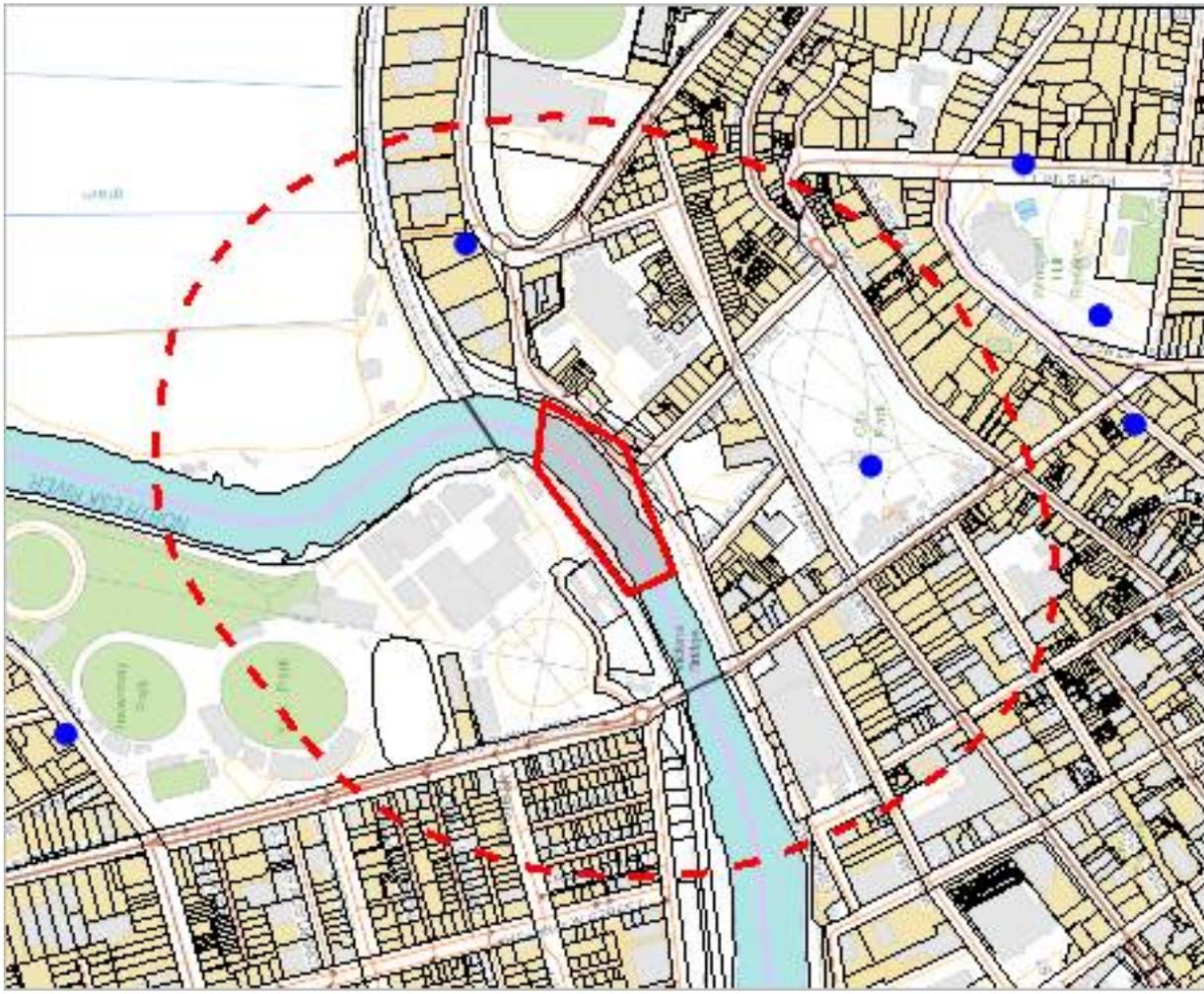
Telephone: 1300 368 550

Email: ThreatenedSpecies.Enquiries@dpiwve.tas.gov.au

Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Threatened fauna within 500 metres

512527, 5414320



511217, 5412741

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Threatened fauna within 500 metres

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

— Line Verified

— Line Unverified

■ Polygon Verified

■ Polygon Unverified

Legend: Cadastral Parcels



Threatened fauna within 500 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
<i>Botaurus poiciloptilus</i>	australasian bittern		EN	n	1	30-Apr-1999
<i>Lathamus discolor</i>	swift parrot	e	CR	mbe	1	23-Oct-1994

Unverified Records

No unverified records were found!

Threatened fauna within 500 metres (based on Range Boundaries)

Species	Common Name	SS	NS	BO	Potential	Known	Core
<i>Litoria raniformis</i>	green and gold frog	v	VU	n	1	0	1
<i>Pseudemoia pagenstecheri</i>	tussock skink	v		n	1	0	0
<i>Aquila audax subsp. fleayi</i>	tasmanian wedge-tailed eagle	e	EN	e	1	0	0
<i>Limnodynastes peroni</i>	striped marsh frog	e		n	1	0	0
<i>Aquila audax</i>	wedge-tailed eagle	pe	PEN	n	1	0	0
<i>Tyto novaehollandiae</i>	masked owl	pe	PVU	n	1	0	1
<i>Perameles gunnii</i>	eastern barred bandicoot		VU	n	1	0	1
<i>Dasyurus maculatus</i>	spotted-tail quoll	r	VU	n	1	0	0
<i>Dasyurus viverrinus</i>	eastern quoll		EN	n	0	0	1
<i>Sarcophilus harrisi</i>	tasmanian devil	e	EN	e	1	0	0
<i>Accipiter novaehollandiae</i>	grey goshawk	e		n	1	0	0
<i>Prototroctes maraena</i>	australian grayling	v	VU	ae	1	0	0
<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle	v		n	2	0	0
<i>Pasmaditta jungermanniae</i>	Cataract Gorge Pinhead Snail or snail (cataract gorge)	v		e	1	0	0

For more information about threatened species, please contact Threatened Species Enquiries.

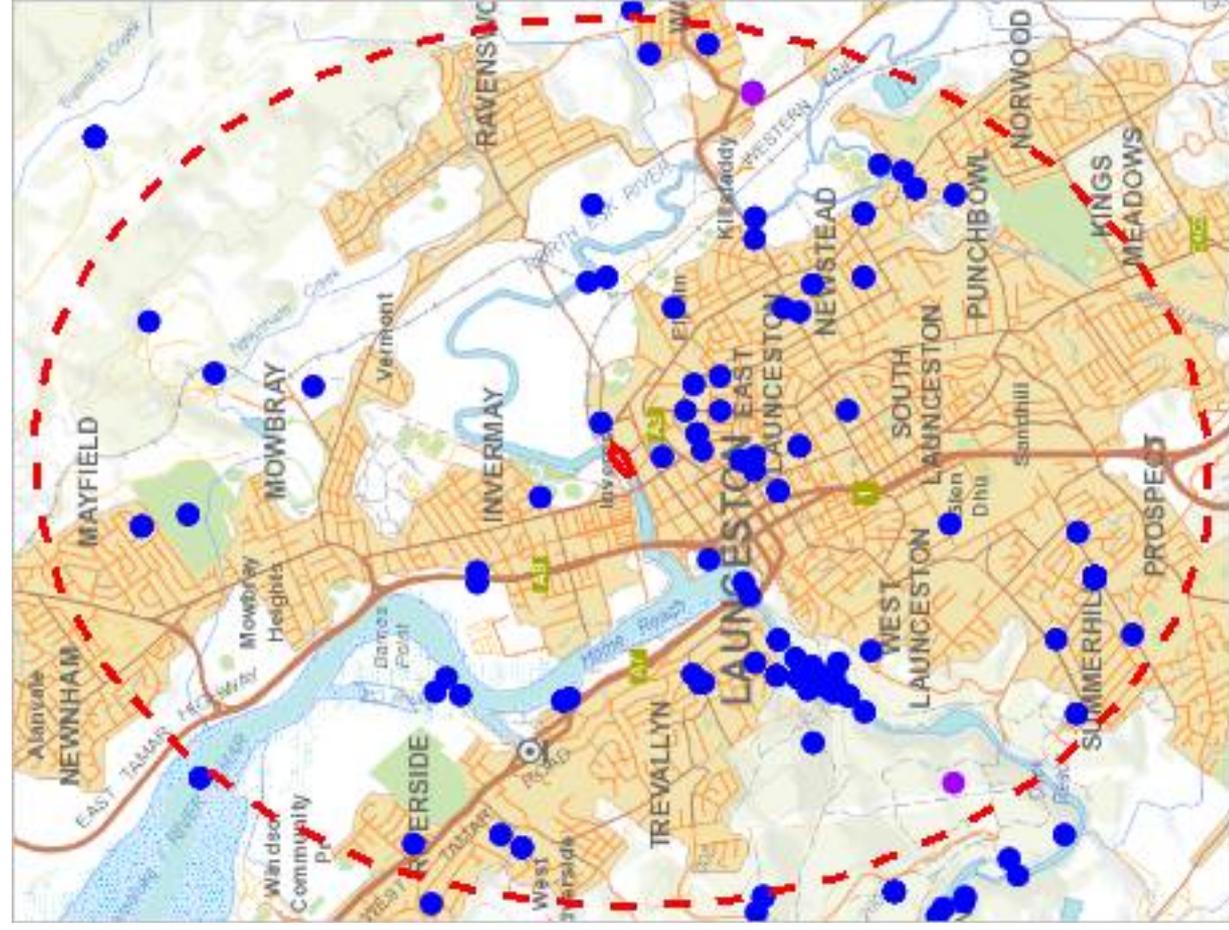
Telephone: 1300 368 550

Email: ThreatenedSpecies.Enquiries@dpiwwe.tas.gov.au

Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Threatened fauna within 5000 metres

515921, 5418813



507829, 5408247

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Threatened fauna within 5000 metres

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Polygon Verified
- Polygon Unverified
- Line Verified
- Line Unverified

Legend: Cadastral Parcels



Threatened fauna within 5000 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Accipiter novaehollandiae	grey goshawk	e		n	11	04-Aug-2018
Aquila audax	wedge-tailed eagle	pe	PEN	n	2	26-Jun-2015
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	e	11	28-Nov-2018
Beddomeia launcestonensis	hydrobiid snail (cataract gorge)	e		eH	10	01-Jan-2001
Botaurus poiciloptilus	australasian bittern		EN	n	12	30-Apr-2010
Dasyurus maculatus	spotted-tail quoll	r	VU	n	5	12-Jul-2018
Dasyurus maculatus subsp. maculatus	spotted-tail quoll	r	VU	n	4	06-Feb-2017
Dasyurus viverrinus	eastern quoll		EN	n	7	07-Apr-2017
Haliaeetus leucogaster	white-bellied sea-eagle	v		n	20	10-Sep-2018
Lathamus discolor	swift parrot	e	CR	mbe	34	10-Sep-2011
Litoria raniformis	green and gold frog	v	VU	n	10	08-Sep-2018
Migas plomleyi	Plomley's trapdoor spider or spider (cataract gorge)	e		e	5	08-May-2001
Pasmaditta jungermanniae	Cataract Gorge Pinhead Snail or snail (cataract gorge)	v		e	10	27-Mar-2016
Perameles gunnii	eastern barred bandicoot		VU	n	7	15-Oct-2015
Perameles gunnii subsp. gunnii	eastern barred bandicoot		VU		2	01-Jun-2013
Poliiocephalus cristatus subsp. australis	great crested grebe	pv			8	31-Aug-1980
Prototroctes maraena	australian grayling	v	VU	ae	7	09-Feb-2016
Pseudemoia pagenstecheri	tussock skink	v		n	1	20-Jun-2018
Pseudemoia rawlinsoni	glossy grass skink	r		n	1	19-Dec-1988
Pteropus poliocephalus	grey-headed flying-fox		VU	n	2	05-May-2010
Sarcophilus harrisi	tasmanian devil	e	EN	e	24	31-Jan-2012
Thylacinus cynocephalus	thylacine	x	EX	ex	1	02-Jun-1972
Tyto novaehollandiae	masked owl	pe	PVU	n	9	01-Dec-1999
Tyto novaehollandiae subsp. castanops	masked owl (tasmanian)	e	VU	e	1	06-Sep-2012

Unverified Records

Species	Common Name	SS	NS	Bio	Observation Count
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	e	1
Dasyurus maculatus subsp. maculatus	spotted-tail quoll	r	VU	n	1

Threatened fauna within 5000 metres (based on Range Boundaries)

Species	Common Name	SS	NS	BO	Potential	Known	Core
Litoria raniformis	green and gold frog	v	VU	n	1	0	1
Pseudemoia pagenstecheri	tussock skink	v		n	1	0	0
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	e	1	0	0
Limnodynastes peroni	striped marsh frog	e		n	1	0	0
Aquila audax	wedge-tailed eagle	pe	PEN	n	2	0	0
Galaxiella pusilla	eastern dwarf galaxias	v	VU	n	1	0	0
Migas plomleyi	Plomley's trapdoor spider or spider (cataract gorge)	e		e	2	0	0
Galaxias fontanus	swan galaxias	e	EN	e	1	0	0
Tyto novaehollandiae	masked owl	pe	PVU	n	1	0	1
Perameles gunnii	eastern barred bandicoot		VU	n	1	0	1
Dasyurus maculatus	spotted-tail quoll	r	VU	n	1	0	0
Dasyurus viverrinus	eastern quoll		EN	n	0	0	1
Pseudemoia rawlinsoni	glossy grass skink	r		n	0	0	1
Beddomeia launcestonensis	hydrobiid snail (cataract gorge)	e		eH	0	1	0
Prototroctes maraena	australian grayling	v	VU	ae	2	0	0
Sarcophilus harrisi	tasmanian devil	e	EN	e	1	0	0
Accipiter novaehollandiae	grey goshawk	e		n	1	0	0
Haliaeetus leucogaster	white-bellied sea-eagle	v		n	2	0	0
Catadromus lacordairei	Green-lined ground beetle	v		n	1	0	0
Pasmaditta jungermanniae	Cataract Gorge Pinhead Snail or snail (cataract gorge)	v		e	1	1	0

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Threatened fauna within 5000 metres

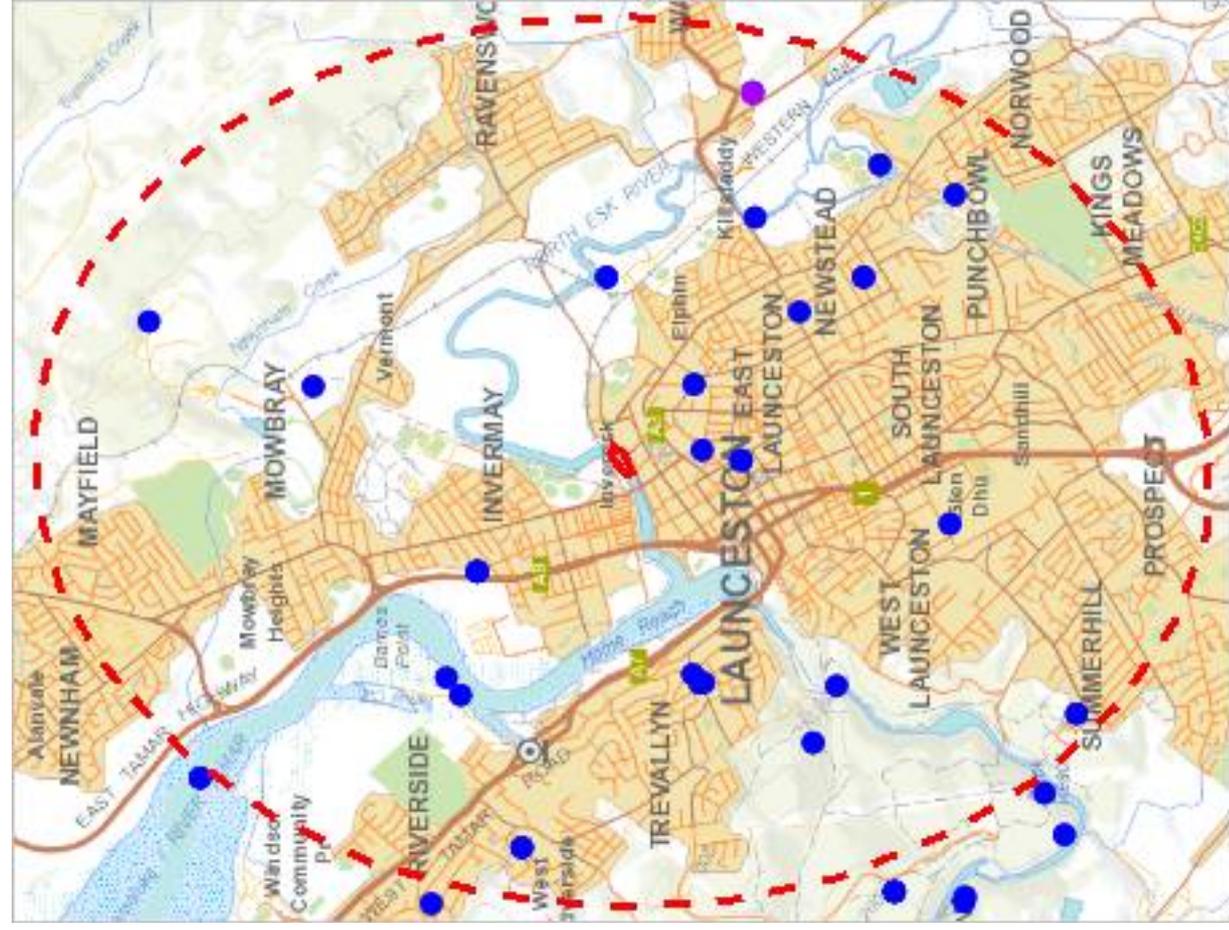
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

***** No Raptor nests or sightings found within 500 metres. *****



Raptor nests and sightings within 5000 metres

515921, 5418813



507829, 5408247

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Raptor nests and sightings within 5000 metres

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

— Line Verified

— Line Unverified

■ Polygon Verified

■ Polygon Unverified

Legend: Cadastral Parcels



Raptor nests and sightings within 5000 metres

Verified Records

Nest Id/Location Foreign Id	Species	Common Name	Obs Type	Observation Count	Last Recorded
114	Falco peregrinus	peregrine falcon	Nest	1	01-Jan-1985
1913	Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	Nest	2	12-Nov-2010
2150	Haliaeetus leucogaster	white-bellied sea-eagle	Nest	1	15-Jun-2014
2219	Aquila audax	wedge-tailed eagle	Nest	1	26-Jun-2015
2329	Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	Nest	1	09-Nov-2016
	Accipiter novaehollandiae	grey goshawk	Carcass	1	15-Nov-2015
	Accipiter novaehollandiae	grey goshawk	Sighting	10	04-Aug-2018
	Aquila audax	wedge-tailed eagle	Sighting	1	11-Sep-1982
	Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	Sighting	8	28-Nov-2018
	Falco longipennis	australian hobby	Sighting	5	02-Nov-1995
	Falco peregrinus	peregrine falcon	Sighting	2	28-Feb-1981
	Haliaeetus leucogaster	white-bellied sea-eagle	Sighting	19	10-Sep-2018
	Tyto novaehollandiae	masked owl	Sighting	9	01-Dec-1999

Unverified Records

Nest Id/Location Foreign Id	Species	Common Name	Obs Type	Observation Count
	Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	Sighting	1

Raptor nests and sightings within 5000 metres (based on Range Boundaries)

Species	Common Name	SS	NS	Potential	Known	Core
Aquila audax	wedge-tailed eagle	pe	PEN	2	0	0
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	1	0	0
Tyto novaehollandiae	masked owl	pe	PVU	1	0	1
Haliaeetus leucogaster	white-bellied sea-eagle	v		2	0	0
Accipiter novaehollandiae	grey goshawk	e		1	0	0

For more information about raptor nests, please contact Threatened Species Enquiries.

Telephone: 1300 368 550

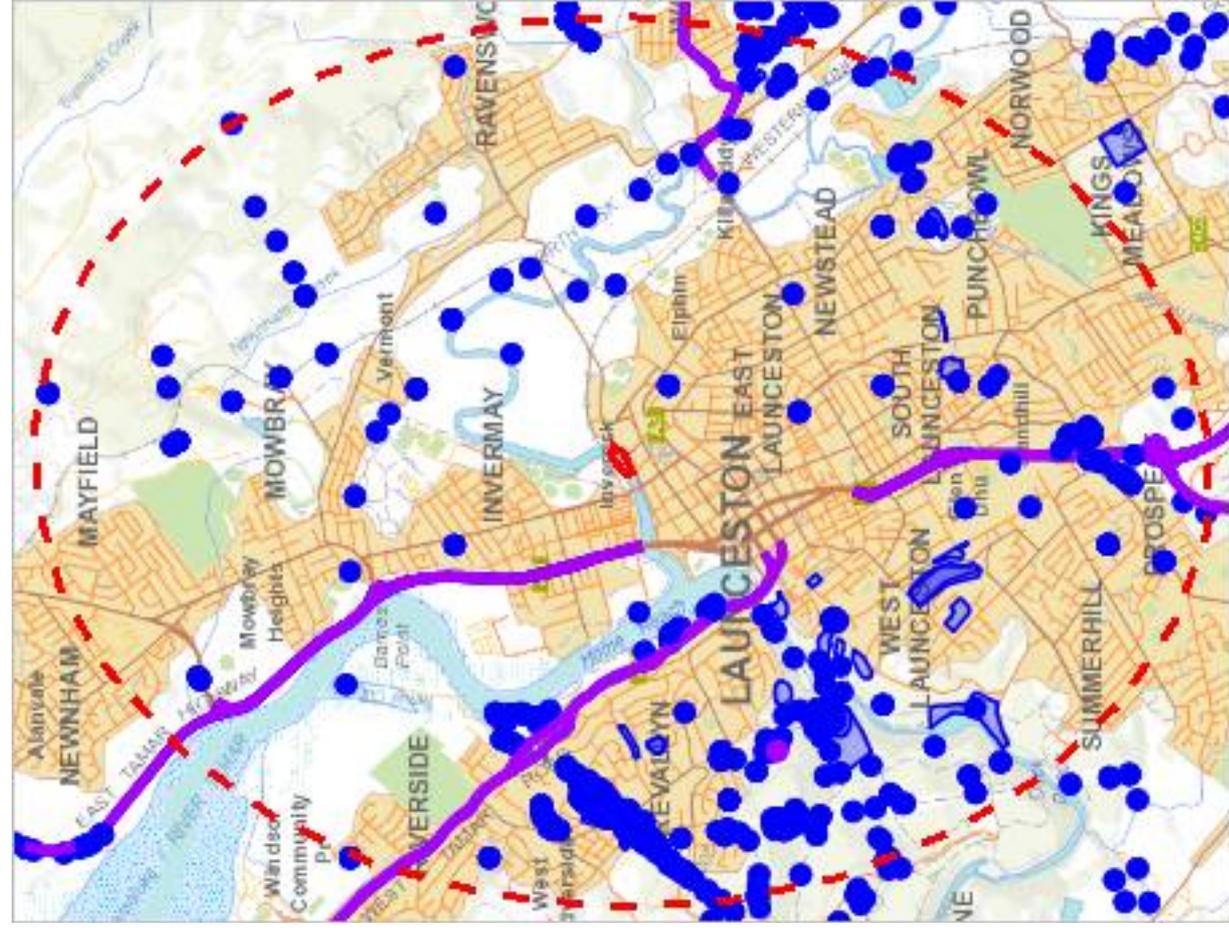
Email: ThreatenedSpecies.Enquiries@dpipwe.tas.gov.au

Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

***** No Tas Management Act Weeds found within 500 metres *****

Tas Management Act Weeds within 5000 m

515921, 5418813



507829, 5408247

Please note that some layers may not display at all requested map scales

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Tas Management Act Weeds within 5000 m

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Polygon Verified
- Polygon Unverified
- Line Verified
- Line Unverified

Legend: Cadastral Parcels



Tas Management Act Weeds within 5000 m



Verified Records

Species	Common Name	Observation Count	Last Recorded
Anthemis cotula	stinking chamomile	2	30-Apr-2010
Asparagus asparagoides	bridal creeper	24	14-Oct-2018
Asphodelus fistulosus	onion weed	1	20-Jun-2001
Calluna vulgaris	heather	1	23-Dec-1947
Carduus pycnocephalus	slender thistle	29	15-Dec-2013
Carduus tenuiflorus	winged thistle	5	05-Nov-2009
Cenchrus longisetus	feathertop	1	13-Feb-2009
Centaurea calcitrapa	star thistle	1	24-Mar-1981
Chrysanthemoides monilifera subsp. monilifera	boneseed	97	25-Apr-2018
Cirsium arvense var. arvense	creeping thistle	1	23-Oct-2012
Cortaderia jubata	pink pampasgrass	2	08-Jan-1995
Cortaderia seloana	silver pampasgrass	5	12-Jul-2011
Cortaderia sp.	pampas grass	27	24-Oct-2016
Cytisus scoparius	english broom	8	15-Dec-2013
Datura ferox	longspine thornapple	1	01-Feb-2005
Datura stramonium	common thornapple	2	06-Mar-2015
Echium plantagineum	patersons curse	59	27-Nov-2018
Echium vulgare	vipers bugloss	1	01-Jan-1878
Elodea canadensis	canadian pondweed	1	07-Mar-2018
Erica lusitanica	spanish heath	91	08-Jul-2018
Erica scoparia	twig heath	5	30-Jul-2013
Foeniculum vulgare	fennel	5	14-Jan-2010
Genista monspessulana	montpellier broom	11	11-Dec-2012
Hypericum perforatum subsp. veronense	perforated st johns-wort	1	18-Jan-1993
Ilex aquifolium	holly	12	03-Aug-2018
Lepidium draba	hoary cress	3	28-Oct-1978
Leycesteria formosa	himalayan honeysuckle	1	01-Nov-2015
Lycium ferocissimum	african boxthorn	1	08-Apr-2016
Marrubium vulgare	white horehound	1	03-Mar-2009
Oenanthe pimpinelloides	dropwort	1	16-Dec-2015
Rubus fruticosus	blackberry	93	11-Dec-2012
Salix alba var. vitellina	golden willow	1	20-Oct-1953
Salix x fragilis nothovar. fragilis	crack willow	24	01-Nov-2015
Salix x sepulcralis nothovar. chrysocoma	golden weeping willow	1	20-Nov-2006
Senecio jacobaea	ragwort	11	18-Nov-2016
Ulex europaeus	gorse	125	14-Oct-2018
Xanthium spinosum	bathurst burr	2	29-Mar-2000

Unverified Records

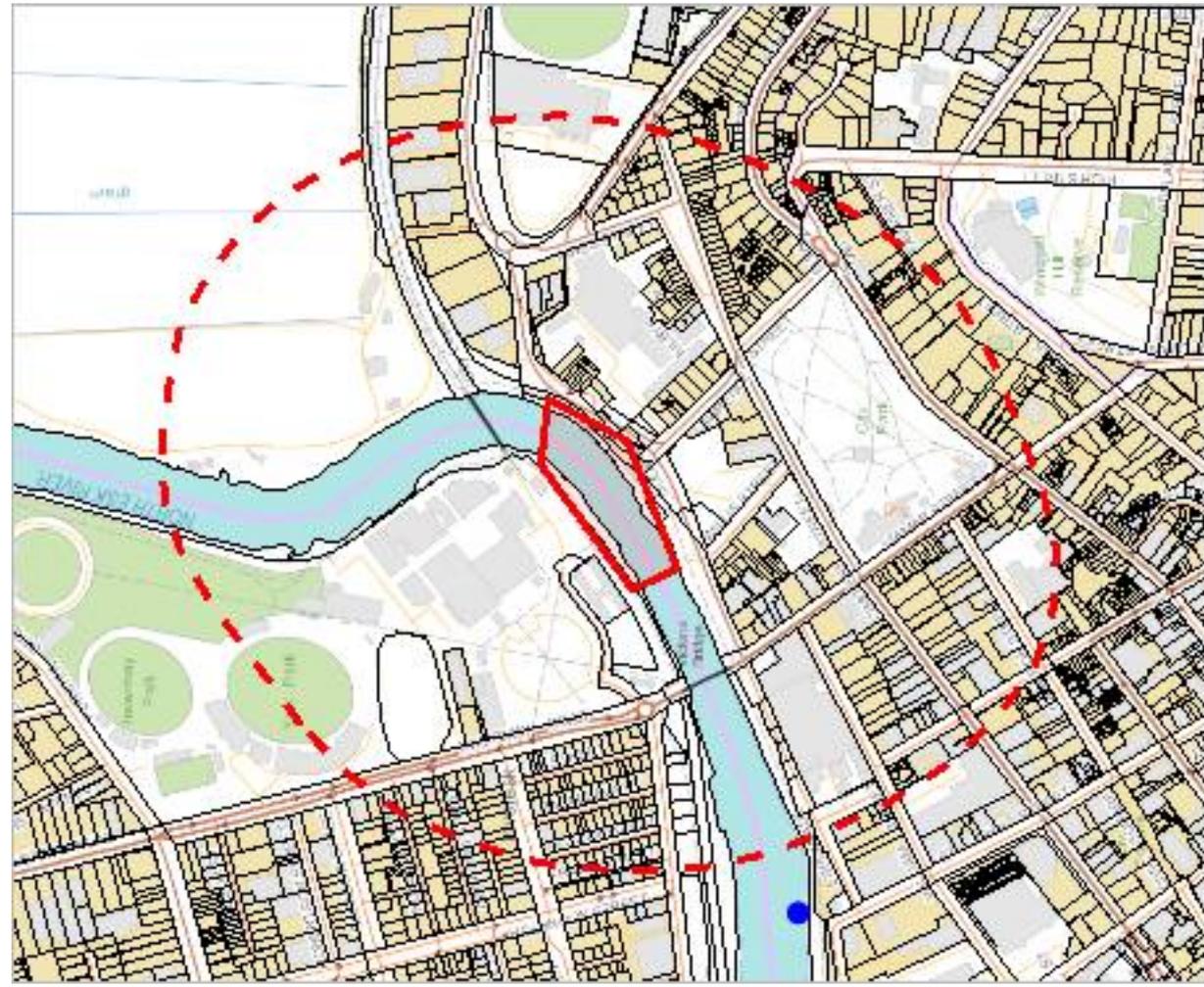
Species	Common Name	Observation Count
Ulex europaeus	gorse	1

For more information about introduced weed species, please visit the following URL for contact details in your area:

<http://dpiwwe.tas.gov.au/invasive-species/weeds>

Priority Weeds within 500 m

512527, 5414320



511217, 5412741

Please note that some layers may not display at all requested map scales

PLANNING EXHIBITED DOCUMENTS
Ref. No: DA 03 12/2019
Date advertised: 21/09/2019
Planning Administrator: [Signature]

Priority Weeds within 500 m

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

▬ Line Verified

▬ Line Unverified

■ Polygon Verified

■ Polygon Unverified

Legend: Cadastral Parcels





Priority Weeds within 500 m

Verified Records

Species	Common Name	Observation Count	Last Recorded
Tradescantia fluminensis	wandering creeper	1	01-Dec-1976

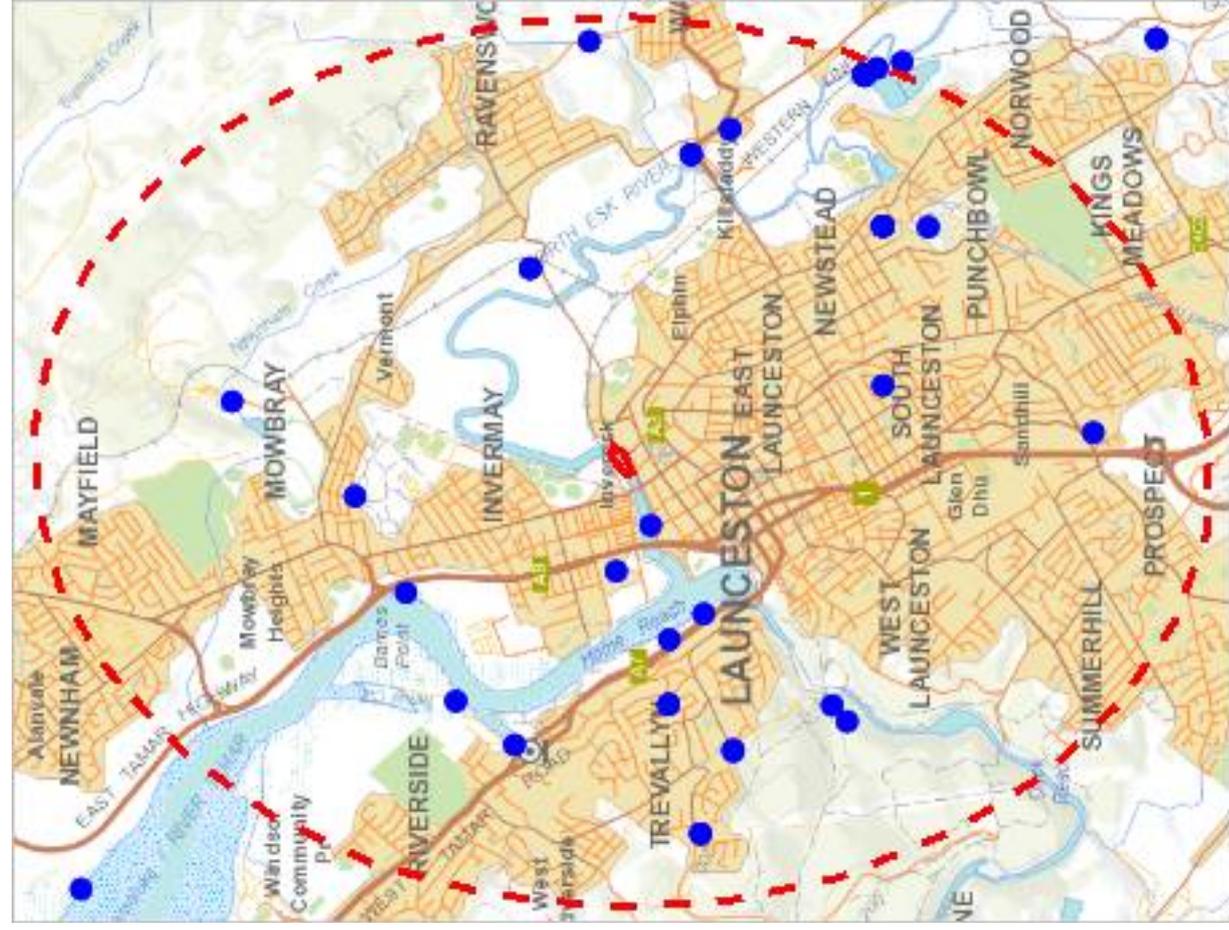
Unverified Records

For more information about introduced weed species, please visit the following URL for contact details in your area:

<http://dpipwe.tas.gov.au/invasive-species/weeds>

Priority Weeds within 5000 m

515921, 5418813



507829, 5408247

Please note that some layers may not display at all requested map scales

PLANNING EXHIBITED DOCUMENTS
Ref. No: DA 03 12/2019
Date advertised: 21/09/2019
Planning Administrator: [Signature]

Priority Weeds within 5000 m

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

▬ Line Verified

▬ Line Unverified

■ Polygon Verified

■ Polygon Unverified

Legend: Cadastral Parcels





Priority Weeds within 5000 m

Verified Records

Species	Common Name	Observation Count	Last Recorded
Acacia baileyana	cootamundra wattle	8	23-Oct-2012
Achillea millefolium	yarrow	1	01-Feb-1971
Anredera cordifolia	madeira vine	1	03-May-1965
Dipsacus fullonum	wild teasel	3	30-Apr-2010
Grevillea rosmarinifolia	rosemary grevillea	1	16-Oct-1972
Iris pseudacorus	yellow flag iris	1	14-Dec-2010
Juncus acutus	sharp rush	1	18-Jan-2009
Pittosporum undulatum	sweet pittosporum	3	11-Apr-2018
Prunus laurocerasus	cherry laurel	2	13-Feb-2009
Reseda luteola	weld	3	11-Jun-2010
Rumex obtusifolius	broadleaf dock	1	29-Apr-2010
Salix x pendulina var. pendulina	weeping willow	1	01-Jan-1993
Spartina anglica	common cordgrass	2	13-Feb-2009
Tradescantia fluminensis	wandering creeper	4	12-Feb-2002
Verbascum thapsus	great mullein	2	10-Jun-2010
Watsonia meriana var. bulbillifera	bulbil watsonia	2	11-Aug-2018

Unverified Records

For more information about introduced weed species, please visit the following URL for contact details in your area:

<http://dpipwe.tas.gov.au/invasive-species/weeds>

***** No Geoconservation sites found within 1000 metres. *****

Acid Sulfate Soils within 1000 metres

512904, 5414820



510840, 5412242

Please note that some layers may not display at all requested map scales



Acid Sulfate Soils within 1000 metres

Legend: Coastal Acid Sulfate Soils (0 - 20m AHD)

- High
- Low
- Extremely Low

Legend: Inland Acid Sulfate Soils (>20m AHD)

- High
- Low
- Extremely Low

Legend: Marine Subaqueous/Intertidal Acid Sulfate Soil

- High (Intertidal)
- High (Subtidal)

Legend: Cadastral Parcels



Acid Sulfate Soils within 1000 metres

Dataset Name	Acid Sulfate Soil Probability	Acid Sulfate Soil Atlas	Description
Coastal Acid Sulfate Soils	Extremely Low	Ci(p3)	Extremely low probability of occurrence (1-5% of mapping unit). with occurrences in small areas. Sandplains and dunes 2-10m AHD, ASS generally below 1m from the surface. Heath, forests. Holocene or Pleistocene. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Coastal Acid Sulfate Soils	High	Ac(p3)	High probability of occurrence (>70% chance of occurrence in mapping unit). Supratidal flats, ASS generally within upper 1m. Halophytes (mainly samphire), salt marsh, salt pans. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Coastal Acid Sulfate Soils	High	Ae(p3)	High probability of occurrence (>70% chance of occurrence in mapping unit). Floodplains <2m AHD, ASS generally within upper 1m. Grasslands, reedlands and wetland forests. (e.g Melaleuca, Casuarina). Includes backplains. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Coastal Acid Sulfate Soils	Low	Be(p3)	Low probability of occurrence (6-70% chance of occurrence in mapping unit). Floodplains <2m AHD, ASS generally within upper 1m. Grasslands, reedlands and wetland forests. (e.g Melaleuca, Casuarina). Includes backplains. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Coastal Acid Sulfate Soils	Low	Bm(p3)	Low probability of occurrence (6-70% chance of occurrence in mapping unit). Hydrosols, ASS generally within upper 1m in wet/riparian areas with Hydrosols (Isbell 1996). Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Coastal Acid Sulfate Soils	Low	Bu(p3)	Low probability of occurrence (6-70% chance of occurrence in mapping unit). Unclassified - Insufficient landscape information available to classify map unit. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Coastal Acid Sulfate Soils	Low	Bx(p3)	Low probability of occurrence (6-70% chance of occurrence in mapping unit). Disturbed ASS terrain, ASS material present below urban development, or present in former tidal zones inside bund walls e.g dredge spoil etc. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.
Marine Subaqueous and Intertidal Acid Sulfate Soils	High	Aa(p2)	High probability of occurrence (>70% chance of occurrence in mapping unit). Subaqueous material in subtidal wetland, PASS material and/or MBO. Often seagrasses. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). Analytical data are incomplete but are sufficient to classify the soil with a reasonable degree of confidence.
Marine Subaqueous and Intertidal Acid Sulfate Soils	High	Ab(p3)	High probability of occurrence (>70% chance of occurrence in mapping unit). Intertidal flats, PASS generally within upper 1m. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments.

For more information about Acid Sulfate Soils, please contact Land Management Enquiries.

Telephone: (03) 6777 2227

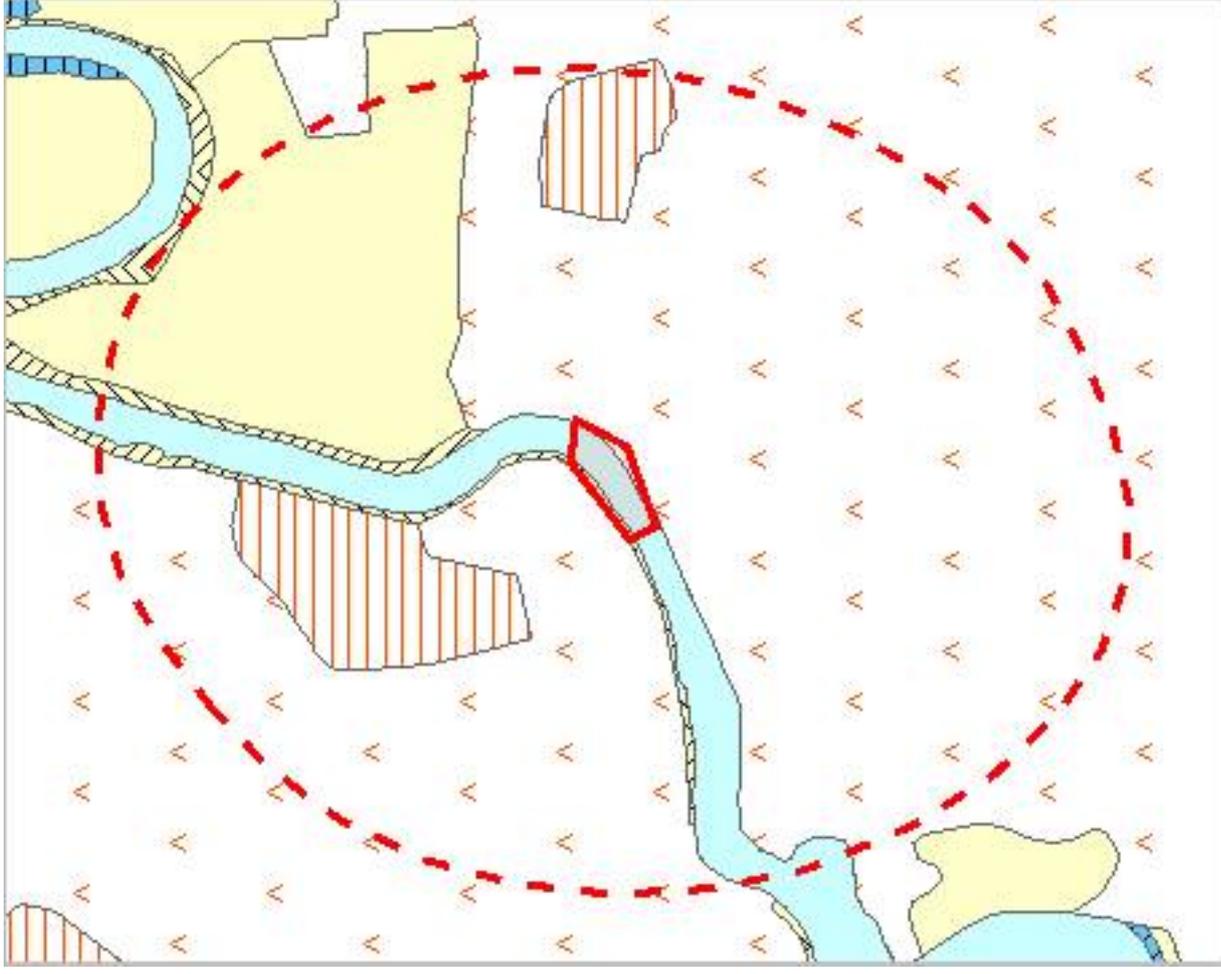
Fax: (03) 6336 5111

Email: LandManagement.Enquiries@dipwe.tas.gov.au

Address: 171 Westbury Road, Prospect, Tasmania, Australia, 7250

TASVEG 3.0 Communities within 1000 metres

512904, 5414820



510840, 5412242

Please note that some layers may not display at all requested map scales



Legend TASVEG 3.0

-  DAC - Eucalyptus amygdalina coastal forest and woodland
-  DAD - Eucalyptus amygdalina forest and woodland on dolerite
-  DAS - Eucalyptus amygdalina forest and woodland on sandstone
-  DAM - Eucalyptus amygdalina forest on mudstone
-  DAZ - Eucalyptus amygdalina inland forest and woodland on Cainozoic deposits
-  DSC - Eucalyptus amygdalina - Eucalyptus obliqua damp sclerophyll forest
-  DBA - Eucalyptus barberi forest and woodland
-  DCO - Eucalyptus coccifera forest and woodland
-  DCR - Eucalyptus cordata forest
-  DDP - Eucalyptus dalrympleana - Eucalyptus pauciflora forest and woodland
-  DDE - Eucalyptus delegatensis dry forest and woodland
-  DGL - Eucalyptus globulus dry forest and woodland
-  DGW - Eucalyptus gunnii woodland
-  DMO - Eucalyptus morrisbyi forest and woodland
-  DNI - Eucalyptus nitida dry forest and woodland
-  DNF - Eucalyptus nitida Furneaux forest
-  DOB - Eucalyptus obliqua dry forest
-  DOV - Eucalyptus ovata forest and woodland
-  DOW - Eucalyptus ovata heathy woodland
-  DPO - Eucalyptus pauciflora forest and woodland not on dolerite
-  DPD - Eucalyptus pauciflora forest and woodland on dolerite
-  DPE - Eucalyptus perriniana forest and woodland
-  DPU - Eucalyptus pulchella forest and woodland
-  DRI - Eucalyptus risdonii forest and woodland
-  DRO - Eucalyptus rodwayi forest and woodland
-  DSO - Eucalyptus sieberi forest and woodland not on granite
-  DSG - Eucalyptus sieberi forest and woodland on granite
-  DTD - Eucalyptus tenuiramis forest and woodland on dolerite
-  DTG - Eucalyptus tenuiramis forest and woodland on granite
-  DTO - Eucalyptus tenuiramis forest and woodland on sediments
-  DVF - Eucalyptus viminalis Furneaux forest and woodland
-  DVG - Eucalyptus viminalis grassy forest and woodland
-  DVC - Eucalyptus viminalis - Eucalyptus globulus coastal forest and woodland
-  DKW - King Island Eucalypt woodland
-  DMW - Midlands woodland complex
-  WBR - Eucalyptus brookeriana wet forest
-  WDA - Eucalyptus dalrympleana forest
-  WDL - Eucalyptus delegatensis forest over Leptospermum
-  WDR - Eucalyptus delegatensis forest over rainforest
-  WDB - Eucalyptus delegatensis forest with broad-leaf shrubs
-  WDU - Eucalyptus delegatensis wet forest (undifferentiated)
-  WGK - Eucalyptus globulus King Island forest
-  WGL - Eucalyptus globulus wet forest
-  WNL - Eucalyptus nitida forest over Leptospermum
-  WNR - Eucalyptus nitida forest over rainforest
-  WNU - Eucalyptus nitida wet forest (undifferentiated)
-  WOL - Eucalyptus obliqua forest over Leptospermum
-  WOR - Eucalyptus obliqua forest over rainforest
-  WOB - Eucalyptus obliqua forest with broad-leaf shrubs
-  WOU - Eucalyptus obliqua wet forest (undifferentiated)
-  WRE - Eucalyptus regnans forest
-  WSU - Eucalyptus subcrenulata forest and woodland
-  WVI - Eucalyptus viminalis wet forest
-  RPF - Athrotaxis cupressoides - Nothofagus gunnii short rainforest
-  RPW - Athrotaxis cupressoides open woodland
-  RPP - Athrotaxis cupressoides rainforest
-  RKF - Athrotaxis selaginoides - Nothofagus gunnii short rainforest
-  RKP - Athrotaxis selaginoides rainforest
-  RKS - Athrotaxis selaginoides subalpine scrub

TASVEG 3.0 Communities within 1000 metres

	RCO - Coastal rainforest
	RSH - Highland low rainforest and scrub
	RKX - Highland rainforest scrub with dead Athrotaxis selaginoides
	RHP - Lagarostrobos franklinii rainforest and scrub
	RMT - Nothofagus - Atherosperma rainforest
	RML - Nothofagus - Leptospermum short rainforest
	RMS - Nothofagus - Phyllocladus short rainforest
	RFS - Nothofagus gunnii rainforest and scrub
	RMU - Nothofagus rainforest (undifferentiated)
	RFE - Rainforest fernland
	NAD - Acacia dealbata forest
	NAR - Acacia melanoxylon forest on rises
	NAF - Acacia melanoxylon swamp forest
	NAL - Allocasuarina littoralis forest
	NAV - Allocasuarina verticillata forest
	NBS - Banksia serrata woodland
	NBA - Bursaria - Acacia woodland and scrub
	NCR - Callitris rhomboidea forest
	NLE - Leptospermum forest
	NLM - Leptospermum lanigerum - Melaleuca squarrosa swamp forest
	NLA - Leptospermum scoparium - Acacia mucronata forest
	NME - Melaleuca ericifolia swamp forest
	NLN - Subalpine Leptospermum nitidum woodland
	AHF - Fresh water aquatic herbland
	ASF - Freshwater aquatic sedgeland and rushland
	AHL - Lacustrine herbland
	AHS - Saline aquatic herbland
	ARS - Saline sedgeland/rushland
	AUS - Saltmarsh (undifferentiated)
	ASS - Succulent saline herbland
	AWU - Wetland (undifferentiated)
	SAL - Acacia longifolia coastal scrub
	SBM - Banksia marginata wet scrub
	SBR - Broad-leaf scrub
	SCH - Coastal heathland
	SSC - Coastal scrub
	SCA - Coastal scrub on alkaline sands
	SRE - Eastern riparian scrub
	SED - Eastern scrub on dolerite
	SCL - Heathland on calcareous substrates
	SKA - Kunzea ambigua regrowth scrub
	SLG - Leptospermum glaucescens heathland and scrub
	SLL - Leptospermum lanigerum scrub
	SLS - Leptospermum scoparium heathland and scrub
	SLW - Leptospermum scrub
	SRF - Leptospermum with rainforest scrub
	SMP - Melaleuca pustulata scrub
	SMM - Melaleuca squamea heathland
	SMR - Melaleuca squarrosa scrub
	SRH - Rookery halophytic herbland
	SSK - Scrub complex on King Island
	SSZ - Spray zone coastal complex
	SHS - Subalpine heathland
	SWR - Western regrowth complex
	SSW - Western subalpine scrub
	SWW - Western wet scrub
	SHW - Wet heathland
	HCH - Alpine coniferous heathland
	HCM - Cushion moorland
	HHE - Eastern alpine heathland
	HSE - Eastern alpine sedgeland



TASVEG 3.0 Communities within 1000 metres



-  HUE - Eastern alpine vegetation (undifferentiated)
-  HHW - Western alpine heathland
-  HSW - Western alpine sedgeland/herbland
-  MAP - Alkaline pans
-  MBU - Buttongrass moorland (undifferentiated)
-  MBS - Buttongrass moorland with emergent shrubs
-  MBE - Eastern buttongrass moorland
-  MGH - Highland grassy sedgeland
-  MBP - Pure buttongrass moorland
-  MRR - Restionaceae rushland
-  MBR - Sparse buttongrass moorland on slopes
-  MSP - Sphagnum peatland
-  MDS - Subalpine Diplarrena latifolia rushland
-  MBW - Western buttongrass moorland
-  MSW - Western lowland sedgeland
-  GHC - Coastal grass and herbfield
-  GPH - Highland Poa grassland
-  GCL - Lowland grassland complex
-  GSL - Lowland grassy sedgeland
-  GPL - Lowland Poa labillardierei grassland
-  GTL - Lowland Themeda triandra grassland
-  GRP - Rockplate grassland
-  FAG - Agricultural land
-  FUM - Extra-urban miscellaneous
-  FMG - Marram grassland
-  FPE - Permanent easements
-  FPL - Plantations for silviculture
-  FPF - Pteridium esculentum fernland
-  FRG - Regenerating cleared land
-  FSM - Spartina marshland
-  FPU - Unverified plantations for silviculture
-  FUR - Urban areas
-  FWU - Weed infestation
-  QCS - Coastal slope complex
-  QCT - Coastal terrace mosaic
-  QKB - Kelp beds
-  QAM - Macquarie alpine mosaic
-  QMI - Mire
-  QST - Short tussock grassland/rushland with herbs
-  QTT - Tall tussock grassland with megaherbs
-  ORO - Lichen lithosere
-  OSM - Sand, mud
-  OAQ - Water, sea

Legend: Cadastral Parcels



TASVEG 3.0 Communities within 1000 metres

Code	Community	Emergent Species
FAG	(FAG) Agricultural land	
FUM	(FUM) Extra-urban miscellaneous	
FUR	(FUR) Urban areas	
FWU	(FWU) Weed infestation	
OAQ	(OAQ) Water, sea	

For more information contact: Coordinator, Tasmanian Vegetation Monitoring and Mapping Program.

Telephone: (03) 6165 4320

Email: TVMMPsupport@dipwe.tas.gov.au

Address: GPO Box 44, Hobart, Tasmania, Australia, 7000



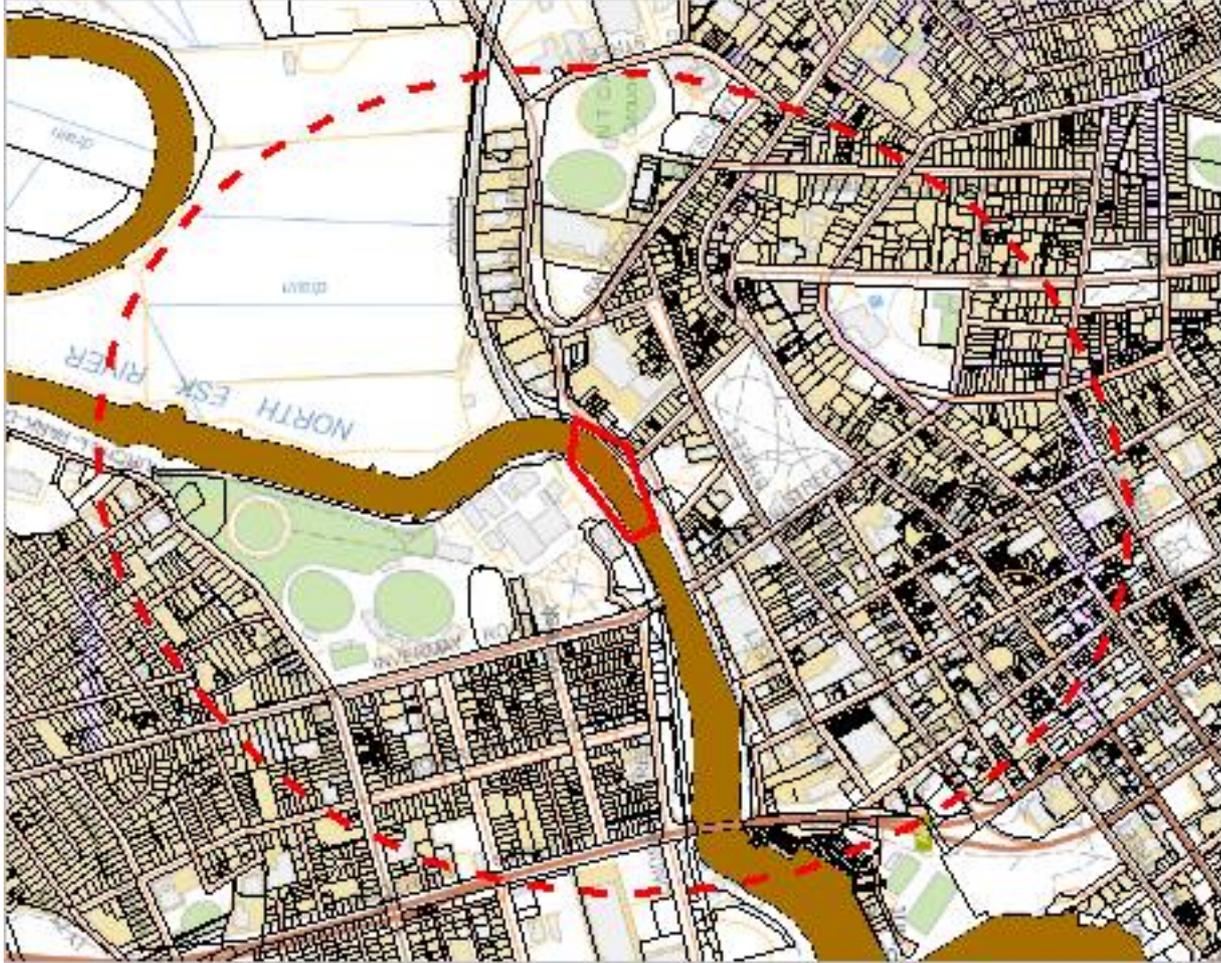
***** No threatened Communities (TNVC 2014) found within 1000 metres *****

***** No Fire History (All) found within 1000 metres *****

***** No Fire History (Last Burnt) found within 1000 metres *****

Reserves within 1000 metres

512904, 5414820



510840, 5412242

Please note that some layers may not display at all requested map scales

PLANNING EXHIBITED DOCUMENTS
Ref. No: DA 03/12/2019
Date Advertised: 21/09/2019
Planning Administrator: [Signature]

Legend: Tasmanian Reserve Estate

-  Conservation Area
-  Conservation Area and Conservation Covenant (NCA)
-  Game Reserve
-  Historic Site
-  Indigenous Protected Area
-  National Park
-  Nature Reserve
-  Nature Recreation Area
-  Regional Reserve
-  State Reserve
-  Wellington Park
-  Public authority land within WHA
-  Future Potential Production Forest
-  Informal Reserve on Permanent Timber Production Zone Land or Forestry Tas. managed land
-  Informal Reserve on other public land
-  Conservation Covenant (NCA)
-  Private Nature Reserve and Conservation Covenant (NCA)
-  Private Sanctuary and Conservation Covenant (NCA)
-  Private Sanctuary
-  Private land within WHA
-  Management Agreement
-  Management Agreement and Stewardship Agreement
-  Stewardship Agreement
-  Part 5 Agreement (Meander Dam Offset)
-  Other Private Reserve

Legend: Cadastral Parcels



Reserves within 1000 metres

Name	Classification	Status	Area (HA)
Tamar Conservation Area	Conservation Area	Other Formal Reserve	0.00262794
Tamar Conservation Area	Conservation Area	Other Formal Reserve	0.0334983
Tamar Conservation Area	Conservation Area	Other Formal Reserve	62.1784
Tamar Conservation Area	Conservation Area	Other Formal Reserve	4451.63

For more information about the Tasmanian Reserve Estate, please contact the Sustainable Land Use and Information Management Branch.

Telephone: (03) 6777 2224

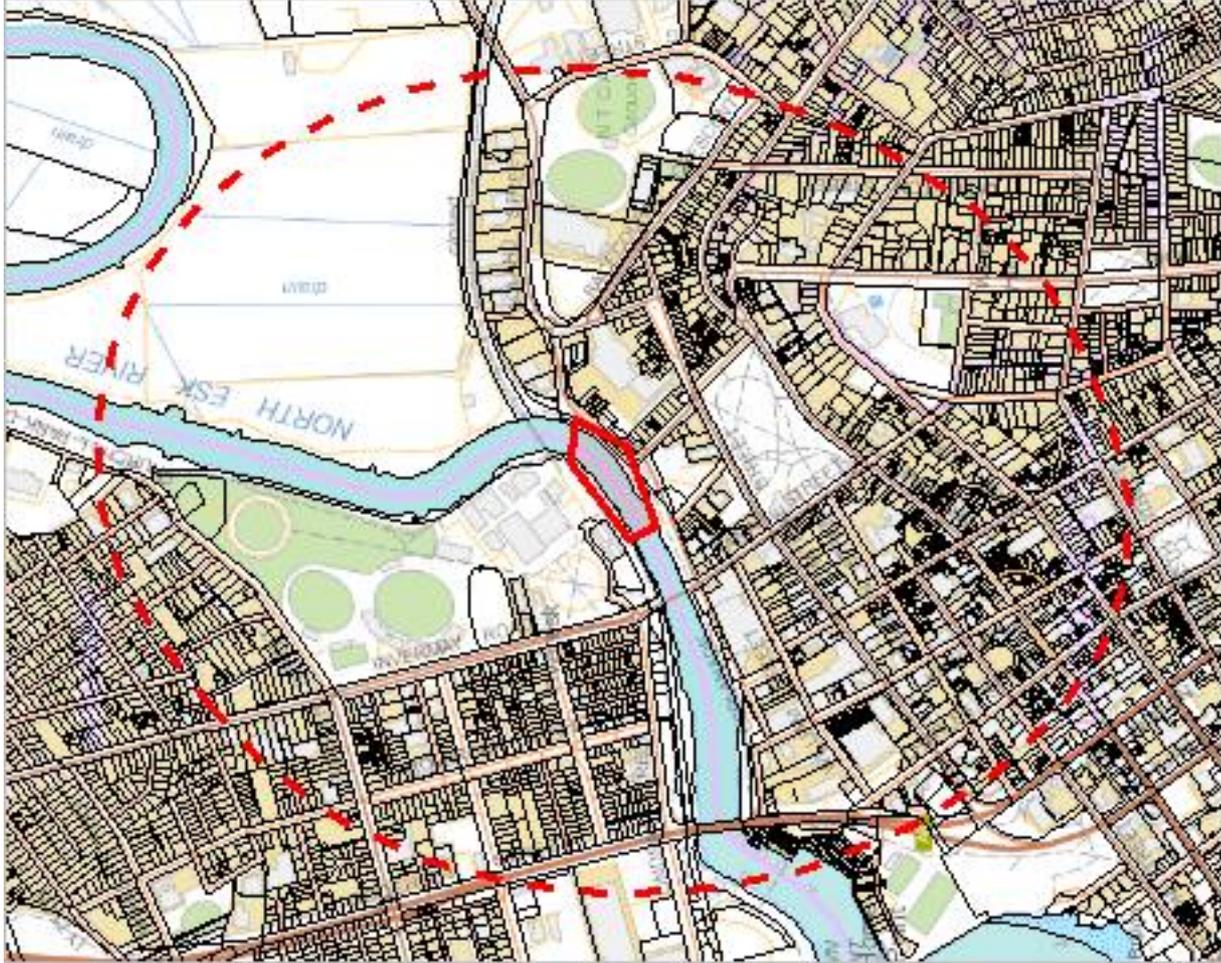
Email: LandManagement.Enquiries@dpiwve.tas.gov.au

Address: GPO Box 44, Hobart, Tasmania, Australia, 7000



Known biosecurity risks within 1000 meters

512904, 5414820



510840, 5412242

Please note that some layers may not display at all requested map scales

Known biosecurity risks within 1000 meters

Legend: Biosecurity Risk Species

-  Point Verified
-  Point Unverified
-  Line Verified
-  Line Unverified
-  Polygon Verified
-  Polygon Unverified

Legend: Hygiene infrastructure

-  Location Point Verified
-  Location Point Unverified
-  Location Line Verified
-  Location Line Unverified
-  Location Polygon Verified
-  Location Polygon Unverified

Legend: Cadastral Parcels



Verified Species of biosecurity risk

No verified species of biosecurity risk found within 1000 metres

Unverified Species of biosecurity risk

No unverified species of biosecurity risk found within 1000 metres

Generic Biosecurity Guidelines

The level and type of hygiene protocols required will vary depending on the tenure, activity and land use of the area. In all cases adhere to the land manager's biosecurity (hygiene) protocols. As a minimum always Check / Clean / Dry (Disinfect) clothing and equipment before trips and between sites within a trip as needed <http://dpiwwe.tas.gov.au/invasive-species/weeds/weed-hygiene/keeping-it-clean-a-tasmanian-field-hygiene-manual>

On Reserved land, the more remote, infrequently visited and undisturbed areas require tighter biosecurity measures.

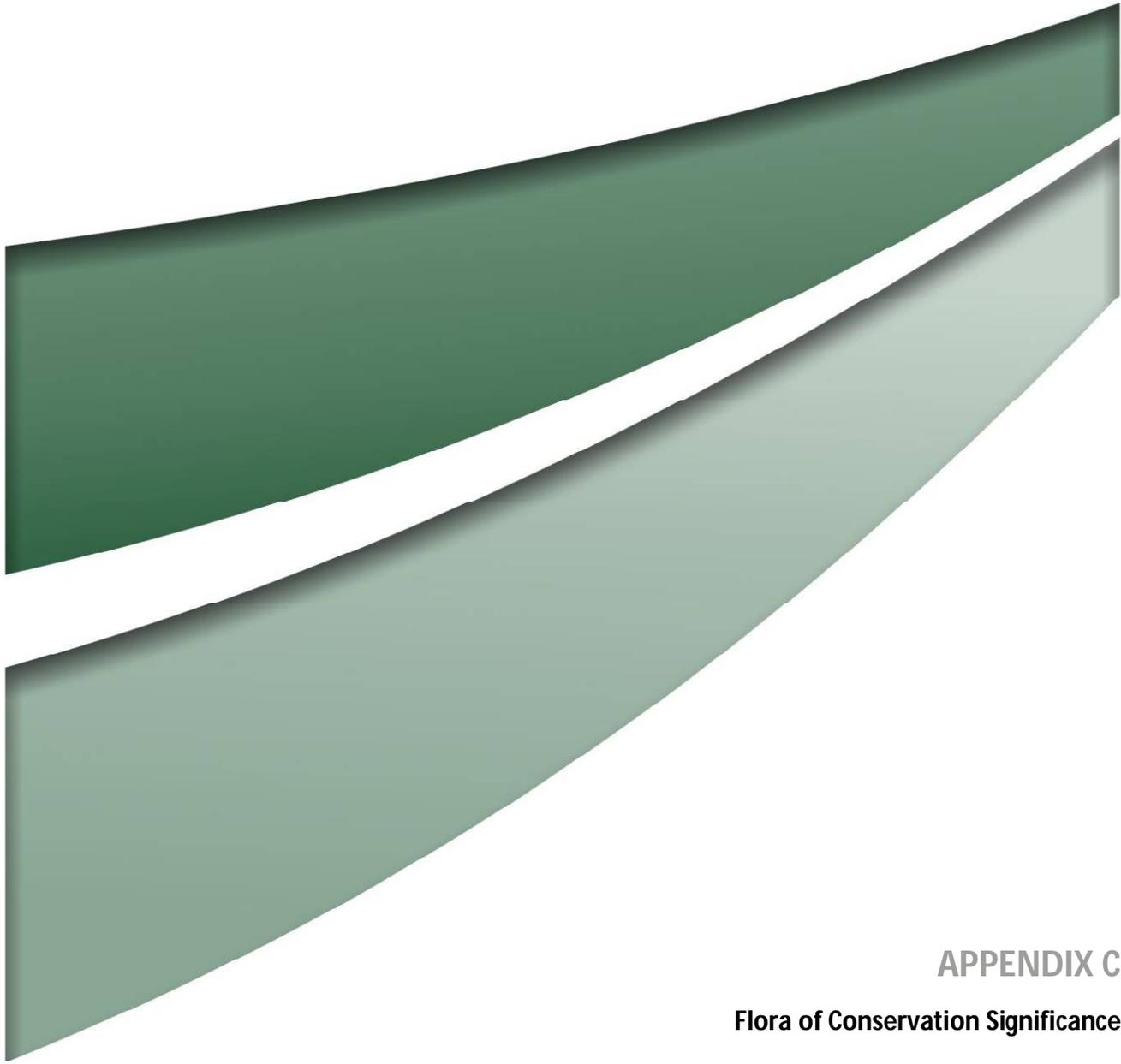
In addition, where susceptible species and communities are known to occur, tighter biosecurity measures are required.

Apply controls relevant to the area / activity:

- Don't access sites infested with pathogen or weed species unless absolutely necessary. If it is necessary to visit, adopt high level hygiene protocols.
- Consider not accessing non-infested sites containing known susceptible species / communities. If it is necessary to visit, adopt high level hygiene protocols.
- Don't undertake activities that might spread pest / pathogen / weed species such as deliberately moving soil or water between areas.
- Modify / restrict activities to reduce the chance of spreading pest / pathogen / weed species e.g. avoid periods when weeds are seeding, avoid clothing/equipment that excessively collects soil and plant material e.g. Velcro, excessive tread on boots.
- Plan routes to visit clean (uninfested) sites prior to dirty (infested) sites. Do not travel through infested areas when moving between sites.
- Minimise the movement of soil, water, plant material and hitchhiking wildlife between areas by using the Check / Clean / Dry (Disinfect when drying is not possible) procedure for all clothing, footwear, equipment, hand tools and vehicles <http://dpiwwe.tas.gov.au/invasive-species/weeds/weed-hygiene>
- Neoprene and netting can take 48 hours to dry, use non-porous gear wherever possible.
- Use walking track boot wash stations where available.
- Keep a hygiene kit in the vehicle that includes a scrubbing brush, boot pick, and disinfectant <http://dpiwwe.tas.gov.au/invasive-species/weeds/weed-hygiene/keeping-it-clean-a-tasmanian-field-hygiene-manual>
- Dispose of all freshwater away from natural water bodies e.g. do not empty water into streams or ponds.
- Dispose of used disinfectant ideally in town through a treatment or septic system. Always keep disinfectant well away from natural water systems.
- Securely contain any high risk pest / pathogen / weed species that must be collected and moved e.g. biological samples.

Hygiene Infrastructure

No known hygiene infrastructure found within 1000 metres



APPENDIX C
Flora of Conservation Significance

Family	Scientific Name	Common Name	(Wealth Status)	R	er	er	Habitats	Potential to Occur
Convolvulaceae	<i>Calystegia sepium</i>	swamp bindweed	-	R	1	er	A riparian species that is widespread throughout temperate Australia. In Tasmania, this species has been recorded from riverbanks and the margins of forests in the north of the State around the Tamar region.	Potential to occur.
Cyperaceae	<i>Schoenoplectus tabernaemontani</i>	river clubsedge	-	R	1		Inhabits the margins of lagoons on King Island, Flinders Island and on some riverbanks in the Midlands.	Potential to occur.
Cyperaceae	<i>Bolboschoenus caldwellii</i>	sea clubsedge	-	R	-	1	In Tasmania, this species occurs in shallow, standing, sometimes brackish water where it is often rooted in heavy black mud.	Potential to occur.
Goodeniaceae	<i>Brunonia australis</i>	blue pincushion	-	R	-	2	Typically occurs in grassy woodlands and dry sclerophyll forests dominated by black peppermint (<i>Eucalyptus amygdalina</i>) or less commonly white gum (<i>Eucalyptus viminalis</i>) or stringybark (<i>Eucalyptus obliqua</i>). Some smaller populations are found in heathy and shrubby dry forests.	Given high levels of disturbance within the Study Area, considered unlikely to occur.

Family	Scientific Name	Common Name	(Wealth Status)	R	er	er	Habitats	Potential to Occur
Orchidaceae	<i>Caladenia filamentosa</i>	daddy longlegs	-	R	-	1	Occurs in lowland heathy and sedgy open eucalypt forest and woodland on sandy soils.	Given high levels of disturbance within the Study Area, considered unlikely to occur.
Cupressaceae	<i>Callitris oblonga</i> subsp. <i>oblonga</i>	south esk pine	E	V	-	1	Occurs in a range of vegetation types, including woodland, scrub and shrubland dominated by eucalypts, the most common dominants being <i>Eucalyptus ovata</i> and <i>Eucalyptus viminalis</i> , followed by <i>Eucalyptus amygdalina</i>	Given high levels of disturbance within the Study Area, considered unlikely to occur.
Asteraceae	<i>Calocephalus lacteus</i>	milky beautyheads	-	R	-	1	Occurs in open, dry sites in lowland areas of eastern and northern Tasmania and on lower altitudes of the Central Plateau. Species requires bare ground for recruitment. Disturbance appears to be beneficial for this species as it is often found on roadsides and beside tracks.	Study Area occurs on the frequently inundated low bank of the Esk River. Due to the high moisture levels of the Study Area, species considered unlikely to occur.

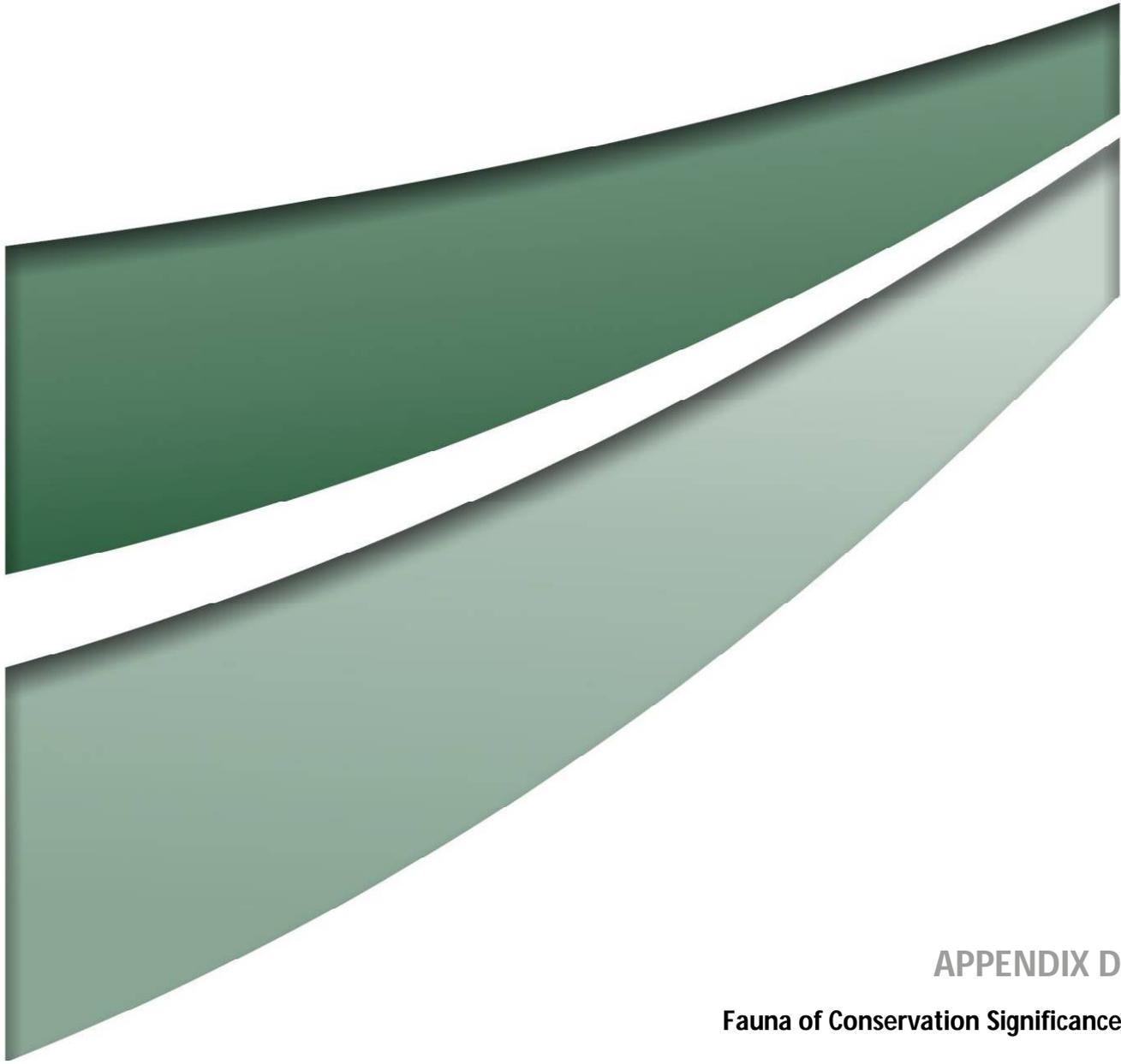
Family	Scientific Name	Common Name	(Wealth Status)	ES	ER	ER	Habitats	Potential to Occur
Convolvulaceae	<i>Calystegia sepium</i>	swamp bindweed	-	R	-	5	Recorded from riverbanks and the margins of forests in the north of the State around the Tamar region. <i>Calystegia sepium</i> is often found twining around the common reed (<i>Phragmites australis</i>) or paperbark (<i>Melaleuca ericifolia</i>).	Due to habitat being present, considered to potentially occur .
Poaceae	<i>Deyeuxia lawrencei</i>	Lawrences bentgrass	Ex	Ex	-	1	This species is endemic to Tasmania and is known only from the type specimen collected by R.W. Lawrence around 1831. The location of this collection is unknown however it is possibly from the Launceston area. Habitat includes dry sclerophyll forest.	Given high levels of disturbance within the Study Area, considered unlikely to occur .
Epacridaceae	<i>Epacris exserta</i>	south Esk heath	E	E	-	2	A strictly riparian species that occurs in areas subject to periodic inundation. It grows on alluvium amongst Jurassic dolerite boulders within dense riparian scrub, or occasionally in open rocky sites.	No suitable habitat present in the Study Area. Unlikely to occur.
Scrophulariaceae	<i>Euphrasia scabra</i>	yellow eyebright	-	E	-	1	Known to occur in the Eastern Tiers near Fingal, near Lake Sorell and near Hobart, occupying approximately 5 hectares in total. Populations in the north from St Marys to Rocky Cape are now believed to be extinct.	No suitable habitat present. Unlikely to occur .

Family	Scientific Name	Common Name	(Wealth Status)	R	er	er	Habitats	Potential to Occur
Dennstaedtiaceae	<i>Hypolepis muelleri</i>	harsh groundfern	-	R	-	1	Occurs along watercourses, swampy areas or deep, rich, alluvial soils below 120 m altitude in northern Tasmania including King and Flinders islands.	Potential to occur.
Urticaceae	<i>Parietaria debilis</i>	shade pellitory	-	R	-	1	Found growing around muttonbird rookeries, on cliffs/rocks in salt spray zone and on grazed pasture/grassland. It has also been recorded from sand dunes with other forbs.	No suitable habitat present. Unlikely to occur.
Lamiaceae	<i>Prostanthera cuneata</i>	alpine mintbush	-	PEx	-	2	Occurs in the alpine and subalpine heaths	No suitable habitat present. Unlikely to occur.
Gentianaceae	<i>Schenkia australis</i>	spike centaury	-	R	-	1	Recorded from cleared forest pasture, rainforest/wet sclerophyll forest and heathland in the east and north of the State	No suitable habitat present. Unlikely to occur.
Cyperaceae	<i>Schoenoplectus tabernaemontani</i>	river clubsedge	-	R	-	2	Inhabits the margins of lagoons on King Island, Flinders Island and on some riverbanks in the Midlands.	Potential to occur.

Family	Scientific Name	Common Name	(Wealth Status)	R	er	er	Habitats	Potential to Occur
Lamiaceae	<i>Scutellaria humilis</i>	dwarf skullcap	-	R	-	1	Found in moist, shady places in the north-east of the State. Key sites include Falmouth, Fingal, George Town, Clarence Point (West Tamar), Launceston, Cataract Gorge, Binalong Bay and Maria Island.	No suitable habitat present. Unlikely to occur.
Asteraceae	<i>Senecio squarrosus</i>	leafy fireweed	-	R	-	1	Species is associated with dry sclerophyll forest.	No suitable habitat present. Unlikely to occur.
Rhamnaceae	<i>Spyridium vexilliferum</i> var. <i>vexilliferum</i>	helicopter bush	-	R	-	3	Is found in sandy heaths and on rocky outcrops in the east, north and west of Tasmania.	No suitable habitat present. Unlikely to occur.
Tremandraceae	<i>Tetratheca ciliata</i>	northern pinkbells	-	R	-	1	Recorded from heathlands and heathy woodlands on sandy well-drained soils, the woodland dominated by <i>Eucalyptus amygdalina</i> (black peppermint). Associated species include <i>Acacia suaveolens</i> , <i>Allocasuarina monilifera</i> , <i>Aotus ericoides</i> , <i>Dillwynia glaberrima</i> , <i>Hibbertia procumbens</i> , <i>Leptospermum scoparium</i> , <i>Lepidosperma concavum</i> and <i>Xanthorrhoea australis</i> .	No suitable habitat present. Unlikely to occur.

Family	Scientific Name	Common Name	(Wealth Status)	R	er	er	Habitats	Potential to Occur
Asteraceae	<i>Vittadinia gracilis</i>	woolly new-holland-daisy	-	R	-	1	Is known from dry sites on dolerite and basalt. It is predominantly found in dry sclerophyll forest around Hobart, into the Midlands and extending up into the north-east.	No suitable habitat present in the Study Area. Unlikely to occur.
Asteraceae	<i>Xerochrysum bicolor</i>	east-coast paperdaisy	-	R	-	1	Species is recorded from heathland near the coast in the north-east, and in alpine situations.	No suitable habitat present in the Study Area. Unlikely to occur.

PEX – Presumed Extinct (EPBC Act and TSP Act), Ex – Extinct (EPBC Act and TSP Act), CE – Critically Endangered (EPBC Act, E – Endangered (EPBC Act and TSP Act), V – Vulnerable (EPBC Act and TSP Act), R – Rare (TSP Act)



APPENDIX D
Fauna of Conservation Significance

Scientific Name	Common Name	Conservation Status	Vermin	Priority	Abundance	Habitats	Potential to Occur
<i>Litoria raniformis</i>	Green and gold frog	V	V	1	10	Is dependent upon permanent freshwater lagoons for breeding. Ideal breeding habitat is the shallow part of lagoons (to approx. 1.5 m) where there is generally a complex vegetation structure. Breeding sites often contain vegetation communities dominated by emergent plants such as water ribbons (<i>Triglochin</i>) and spikerush (<i>Eleocharis</i>), and submerged plants such as watermilfoil (<i>Myriophyllum</i>), marsh-flower (<i>Villarsia</i>), and pondweed (<i>Potamogeton</i>). However, other plant communities can form equally suitable habitat.	No suitable habitat present in the Study Area. Unlikely to occur.
<i>Pseudemoia pagenstecheri</i>	Tussock skink	-	V	1	1	Found exclusively in tussock grassland habitats where trees are absent or form only well-spaced woodland. They prefer areas where the grass is medium to tall.	No suitable habitat present in the Study Area. Unlikely to occur.
<i>Aquila audax</i> subsp. <i>fleayi</i>	Tasmanian wedge-tailed eagle	E	E	1	11	Inhabits coastal, lowland and highland regions. It has been recorded in a wide variety of habitats including dry sclerophyll forest, temperate rainforest, sub-alpine forest, dry woodland, coastal heathland, small wetlands, riparian vegetation, sedgeland, grassland and farmland.	Potential to occur.
<i>Accipiter novaehollandiae</i>	Grey goshawk	-	E	-	10	The species nests in mature wet forest, usually in the vicinity of a watercourse. However birds can also be seen in more open woodland and around urban fringes.	Potential to occur.

Scientific Name	Common Name	C'wealth S	ES	er 05	er 1	Habitats	Potential to Occur
<i>Limnodynastes peroni</i>	Striped marsh frog	-	E	1		Is dependent upon permanent freshwater lagoons for breeding. Ideal breeding habitat is the shallow part of lagoons (to approx. 1.5 m) where there is generally a complex vegetation structure. Breeding sites often contain vegetation communities dominated by emergent plants such as water ribbons (<i>Triglochin</i>) and spikerush (<i>Eleocharis</i>), and submerged plants such as watermilfoil (<i>Myriophyllum</i>), marsh-flower (<i>Villarsia</i>), and pondweed (<i>Potamogeton</i>). However, other plant communities can form equally suitable habitat.	No suitable habitat present in the Study Area. Unlikely to occur.
<i>Tyto novaehollandiae</i>	Masked owl	V	PEX	1	8	A diverse range of forest, woodland and non-forest vegetation including agricultural and forest mosaics; nesting habitat - eucalypt forests and woodlands containing old growth trees with suitable hollows for nesting/roosting, but will also nest in isolated old growth trees with suitable hollows.	No suitable habitat present in the Study Area. Unlikely to occur.
<i>Perameles gunnii</i>	Eastern barred bandicoot	V	-	1	8	Mosaic habitats of pasture and remnant native forest, often with a significant amount of cover provided by dense-growing weeds such as gorse, blackberry, blackthorn, rose briar, etc.; small remnant populations may occur in remnant native grassland and grassy woodland; all records occur below 950 m altitude.	No suitable habitat present in the Study Area. Unlikely to occur.

Scientific Name	Common Name	Conservation Status	Priority	Abundance	Habitats	Potential to Occur
<i>Dasyurus maculatus</i>	Spotted-tailed quoll	V	R	1	11	No suitable habitat present in the Study Area. Unlikely to occur.
<i>Dasyurus viverrinus</i>	Eastern quoll	E	-	0	7	No suitable habitat present in the Study Area. Unlikely to occur.
<i>Sarcophilus harrisi</i>	Tasmanian devil	E	E	1		No suitable habitat present in the Study Area. Unlikely to occur.
<i>Thylacine cynocephalus</i>	Thylacine	Ex	Ex	-	1	No suitable habitat present in the Study Area. Unlikely to occur.

Scientific Name	Common Name	C'wealth S	S	er 05	er 1	Habitats	Potential to Occur
<i>Pseudemoia rawlinsoni</i>	Glossy grass skink	-	R	-	1	Habitat includes rushy grasses and low dense vegetation in moist situations along the margins of swamps and watercourses. The species has also been found where dry sclerophyll forest meets wet heathland subject to frequent flooding. It shelters in dense vegetation and in rotting logs.	No suitable habitat present in the Study Area. Unlikely to occur.
<i>Prototroctes maraena</i>	Australian grayling	V	V	1	3	Adult Australian Grayling inhabit and breed in rivers and streams, usually in cool waters often with alternating pool and riffle zones; larvae and juveniles inhabit estuaries and coastal seas, although their precise habitat requirements are poorly known.	Potential to occur.
<i>Pteropus poliocephalus</i>	Grey-headed Flying fox	V	-	-	2	Species typically restricted to mainland Australia. Occasional transient individual may occur in Tasmania.	No suitable habitat present in the Study Area. Unlikely to occur.
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle	-	V	2	10	Mainly coastal, it is also found in many large rivers and lakes. Tasmania's coastline with its many rivers, bays and islands provides ideal habitats.	Potential to occur.

Scientific Name	Common Name	CE	E	-	er	er	Habitats	Potential to Occur
<i>Lathamus discolor</i>	Swift Parrot	CE	E	-	16	er	Habitat for the Swift Parrot outside of the breeding season in Tasmania includes any eucalypt forest. Habitat for Swift Parrot during the breeding season broadly includes the following elements: flowering Tasmanian blue gum and black gums (foraging habitat) and any eucalypt forest containing hollow-bearing trees (nesting habitat). Hollow-bearing trees are typically large and old with dead limbs or branches and at least some visible hollows. Note that the importance of breeding habitat in any one year varies depending on its location in relation to foraging habitat (i.e. blue gums or black gums in flower).	No suitable habitat present in the Study Area. Unlikely to occur.
<i>Botaurus poiciloptilus</i>	Australasian bittern	E	-	-	4	er	Found in shallow and vegetated freshwater or brackish swamps.	Potential to occur.
<i>Migas plomleyi</i>	Plomleys Trapdoor Spider	-	E	-	4	er	Moss covered boulders in Launceston's Cataract Gorge.	No suitable habitat present in the Study Area. Unlikely to occur.

Scientific Name	Common Name	C'wealth S	S	er	er	Habitats	Potential to Occur
<i>Engaeus orramakunna</i>	Mount Arthur Burrowing Crayfish	V	V			The Mt Arthur Burrowing Crayfish is known from a range of approximately 300 square km centred on Mt. Arthur in north-east Tasmania. The species extends to near Lilydale, Nabowla and South Springfield, and is also found in the vicinity of Launceston. This is a freshwater species. The Mt Arthur Burrowing Crayfish prefers moist seeps and flat swampy or marshy land feeding into or next to streams and rivers, but can also be found in stream banks, wet pasture, culverts and roadside drains.	No suitable habitat present in the Study Area. Unlikely to occur.
<i>Posmaditta jungermanniae</i>	Cataract Gorge Pinhead Snail	-	V	1	10	A freshwater snail occurring in some sections of Lake Trevallyn and Cataract Gorge, at Launceston, in central north Tasmania.	No suitable habitat present in the Study Area. Unlikely to occur.
<i>Beddomeia launcestonensis</i>	Hydrobiid snail (Cataract Gorge)	-	E	-	8	A freshwater snail occurring in some sections of Lake Trevallyn and Cataract Gorge, at Launceston, in central north Tasmania.	No suitable habitat present in the Study Area. Unlikely to occur.

PEx – Presumed Extinct (EPBC Act and TSP Act), Ex – Extinct (EPBC Act and TSP Act), CE – Critically Endangered (EPBC Act and TSP Act), E – Endangered (EPBC Act and TSP Act), V – Vulnerable (EPBC Act and TSP Act), R – Rare (TSP Act)



APPENDIX E

Commonwealth Impact Assessment

Endangered Tasmanian Wedge-tailed Eagle

Significant Impact Criteria Assessment

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

- *lead to a long-term decrease in the size of a population*

The proposed development occurs in a highly modified landscape between the central business district of Launceston, and the Inveresk Community Precinct. The proposed development is not expected to result in a long-term decrease in the size of the Tasmanian wedge-tailed eagle population as no breeding habitat will be impacted, and only a short term impact will result on potential low quality foraging areas for this species.

- *reduce the area of occupancy of the species*

The proposed development will result in the redevelopment of highly disturbed fringing habitats to the North Esk River of a total area of 0.25 ha.

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

Due to the high mobility of this species, the proposed development will not fragment existing populations into two or more populations.

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

No critical habitat for the Tasmanian wedge-tailed eagle has been identified. The habitat present in the Study Area is considered likely to represent low quality potential foraging habitat for this species.

- *disrupt the breeding cycle of a population*

No breeding habitat for wedge-tailed eagle occurs within or adjacent to the Study Area. Therefore the proposed development will not disrupt the breeding cycle of this species.

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

The habitat present in the Study Area is considered likely to represent low quality potential foraging habitat for this species. The proposed construction of the pedestrian-cycleway bridge will result in the disturbance of 0.25 ha of this habitat. Due to the high mobility of this species, this impact will not adversely modify, destroy, isolate or decrease availability or quality of habitat to the extent that the species will be likely to decline or impact any critical habitat for this species.

- *result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

Due to the highly urbanised landscape, the proposed development is unlikely to result in invasive species that are harmful to this species become established in the potential foraging habitat identified within the Study Area.

- *introduce disease that may cause the species to decline, or*

Construction activities associated with the proposed development are unlikely to introduce any diseases that may cause the wedge-tailed eagle species to decline.

- *interfere with the recovery of the species.*

The proposed development will not interfere with the recovery of this species as the area of impact will be less than 0.25 ha of low quality potential foraging habitat. No roosting trees or nesting locations were identified in or near the Study Area.

Endangered Australasian bittern

Significant Impact Criteria Assessment

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

- *lead to a long-term decrease in the size of a population*

The proposed development occurs in a highly modified landscape between the central business district of Launceston, and the Inveresk Community Precinct. The proposed development is not expected to result in a long-term decrease in the size of the Australasian bittern population as no breeding habitat will be impacted as this species predominantly breeds in freshwater swamps, and only a short term impact will result on potential low quality foraging areas for this species will be impacted.

- *reduce the area of occupancy of the species*

The proposed development will result in the redevelopment of highly disturbed fringing habitats to the North Esk River of a total area of 0.25 ha. The available habitats present in the Study Area are considered low quality habitat for this predominantly freshwater species.

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

Due to the high mobility of this species, the proposed development will not fragment existing populations into two or more populations.

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

No critical habitat for the Australasian bittern has been identified. The habitat present in the Study Area is considered likely to represent low quality potential foraging habitat for this species.

- *disrupt the breeding cycle of a population*

No breeding habitat for Australasian bittern occurs within or adjacent to the Study Area. Therefore the proposed development will not disrupt the breeding cycle of this species.

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

The habitat present in the Study Area is considered likely to represent low quality potential foraging habitat for this species. The proposed construction of the pedestrian-cycleway bridge will result in the disturbance of 0.25 ha of marginal habitat. Due to the high mobility of this species, this impact will not adversely

modify, destroy, isolate or decrease availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

Due to the highly urbanised landscape, the proposed development is unlikely to result in invasive species that are harmful to this species become established in the potential foraging habitat identified within the Study Area.

- *introduce disease that may cause the species to decline, or*

The construction activities associated with the proposed development are unlikely to introduce any diseases that may cause the Australasian bittern species to decline.

- *interfere with the recovery of the species.*

The proposed development will not interfere with the recovery of this species as the area of impact will be less than 0.25 ha of low quality potential foraging habitat. No roosting trees or nesting locations were identified in or near the Study Area.

Vulnerable Eastern Grayling

Significant Impact Criteria Assessment

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

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

The proposed development will not lead to a long-term decrease in the size of an important population. With respect to the habitat of this species, impacts from the proposed development will be restricted to the installation of one instream bridge pylon. This species main lifecycle stages (adult occurrence and breeding) occur in freshwater, upstream of the estuarine Study Area. Larvae of this species are typically swept downstream into marine waters, from where juveniles eventually move back to the freshwater stream from where they were born. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not result in a decrease in the size of a population of this species.

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

The proposed development will not reduce the area of occupancy of an important population of this species. With respect to the habitat of this species, impacts from the proposed development will be restricted to the installation of one instream bridge pylon in an estuarine area. This species main lifecycle stages (adult occurrence and breeding) occur in freshwater, upstream of the Study. Larvae of this species are seasonally swept downstream into marine waters, from where juveniles eventually move back to the freshwater areas from where they were born. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not result in a reduction in the area of occupancy of an important population of this species.

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

The proposed development will not fragment populations of this species as impacts on the habitat of this species will be restricted to the installation of one instream bridge pylon. This species main lifecycle stages (live and breeding) occur in freshwater, upstream of the Study Area. Larvae of this species are typically swept downstream into marine waters, from where they eventually move back to the freshwater stream where they were born. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not fragment the habitat of this species.

- adversely affect habitat critical to the survival of a species

No critical habitat for this species has been identified under the EPBC Act. The proposed development will impact two small areas within the North Esk channel, associated with the installation of one instream bridge pylon. This species main lifecycle stages (live and breeding) occur in freshwater, upstream of the Study Area. Larvae of this species are typically swept downstream into marine waters, from where they eventually move back to the freshwater stream where they were born. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not adversely affect habitat for this species.

- *disrupt the breeding cycle of an important population*

This species main lifecycle stages (adult and breeding) occur in freshwater, upstream of the Study Area. Larvae of this species are typically swept downstream into marine waters, from where juveniles eventually move back to the freshwater reaches from where they were born. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not adversely disrupt the breeding cycle of an important population of this species.

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

The proposed development will not interfere with the recovery of this species as the area of impact will be restricted to the installation of one bridge pylon. This species main lifecycle stages (live and breeding) occur in freshwater, upstream of the Study Area. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not impact the species or the habitat of this species to the point that the extent of this species is likely to decline.

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

The proposed development does not involve the relocation of any fish species. No invasive fish, harmful to the Australian Grayling will therefore become established in the North Esk River as a result of this development.

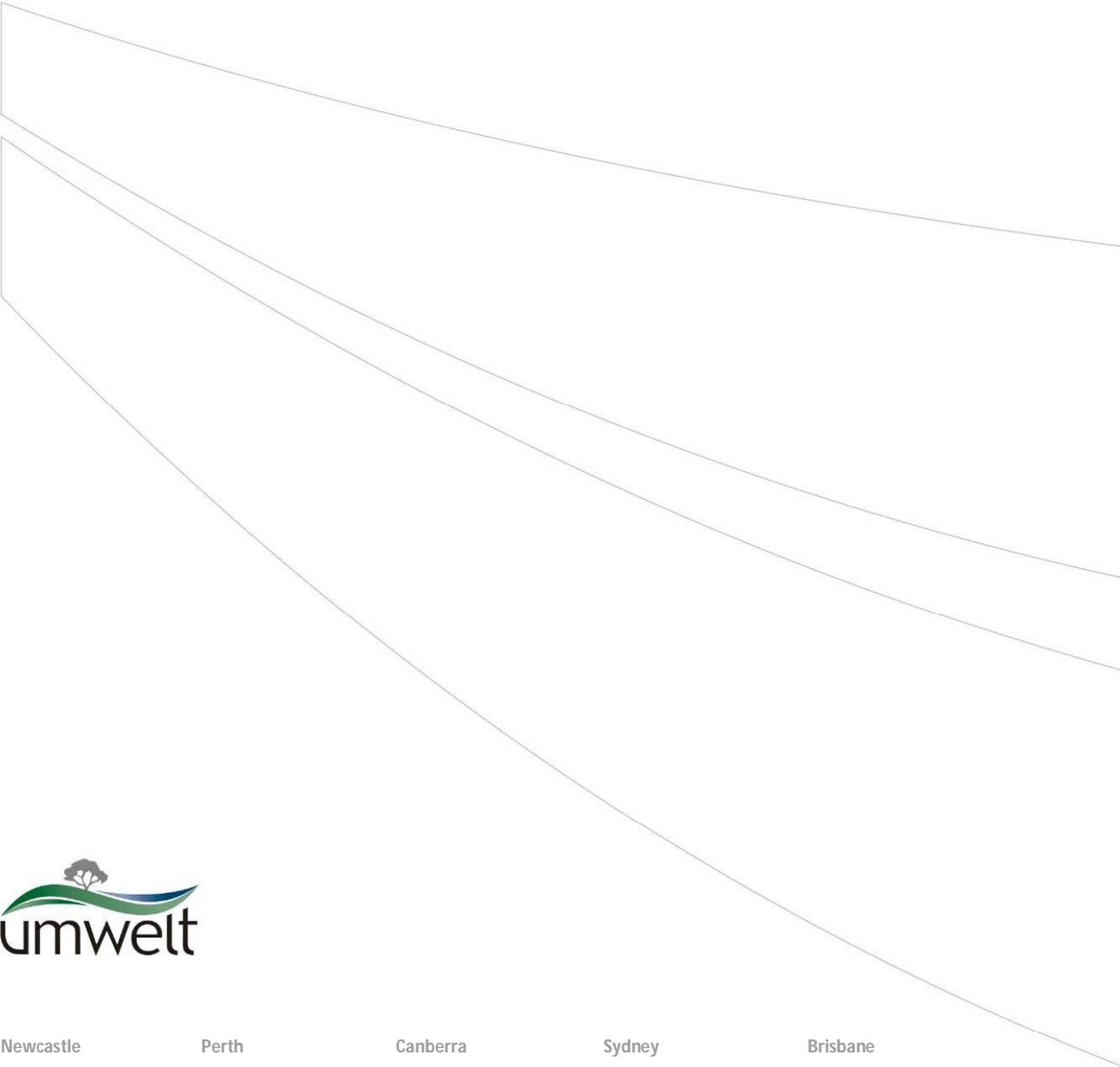
- introduce disease that may cause the species to decline, or

The proposed development does not involve the relocation of any fish species. No introduced diseases harmful to the Australian Grayling will therefore be introduced to the Study Area.

- interfere substantially with the recovery of the species.

The proposed development will not interfere with the recovery of this species as the area of impact will be restricted to the installation of one instream bridge pylon. This species main lifecycle stages (live and breeding) occur in freshwater, upstream of the Study Area. Larvae of this species are typically swept

downstream into marine waters, from where they eventually move back to the freshwater stream where they were born. As no barriers to the flow of water into and out of the North Esk River will result from the proposed development, the proposed development will not impact the recovery of this species.



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Environmental Site Assessment

Appendix C

pitt&sherry

Phase 1 Environmental Site Assessment

Proposed UTAS Pedestrian Bridge
Invermay

Prepared for
University of Tasmania (UTAS)

Client representative
Sam Tucker

Date
21 May 2019

Rev 00



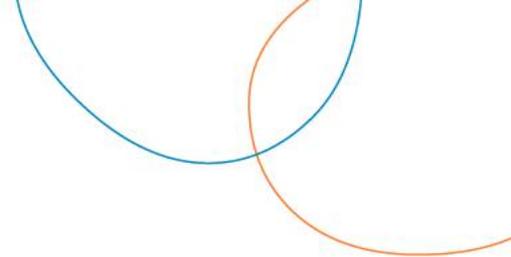
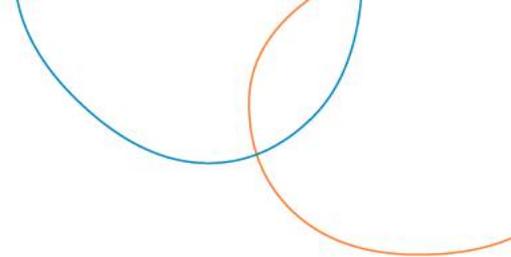


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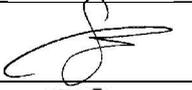
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- Appendix E** — Laboratory Certificate of Analysis

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Authorised by — David Lenel		Date — 21 May 2019

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Executive Summary

This report presents the findings of a Phase 1 Environmental Site Assessment (ESA) undertaken by pitt&sherry for the land impacted by a proposed pedestrian-cycle bridge at the UTAS Invermay Campus, Launceston. An ESA is required because over 1 m² of soil will be excavated during the bridge construction period. It is understood that the excavation of soils up to 1 m below the ground surface will be necessary, however the areas of excavation will be minimal. The current land use is public open space and the proposed works do not represent a change in site use.

The assessment consisted of a site history review, site inspection and limited shallow soil sampling and chemical analysis. Soil sampling was undertaken for preliminary waste classification purposes. The desk study included all available site and off-site environmentally relevant information to identify potentially contaminated areas and specific contaminants of concern.

Previous potentially contaminating activities were identified at the site and neighbouring properties (railyards, workshops, concrete works, underground petroleum storage sites (UPSS), gasworks and potential imported fill), which may have resulted in soil and groundwater contamination at the site (metals, hydrocarbons, polychlorinated biphenyls, pesticides and phenols).

The soil analytical results were compared against the EPA Tasmania Classification and Management of Contaminated Soil for Disposal Guidelines (Version 3 2018). With the exception of sample BH-E, all the analytical results were below the Low Level Contaminated Soil Level 2 criteria. Concentrations of benzo(a)pyrene and lead were detected in sample BH-E above the respective Maximum Total Level 2 waste criteria. Total Characteristic Leaching Procedure (TCLP) extraction was subsequently scheduled on sample BH-E to allow classification against the maximum TCLP benzo(a)pyrene and lead criteria, which take precedence over the maximum total concentration. Although the TCLP benzo(a)pyrene concentration was below the Level 2 criteria, the TCLP lead concentration exceeded, resulting in the sample classification remaining as Contaminated Soil - Level 3.

Due to the inherent variability of the soil and in-situ waste classification, excavated soils should be treated as potentially contaminated and appropriately stored on site until visual inspection of the material and sampling for waste classification purposes have been completed.

1. Introduction

1.1 Background

pitt&sherry were engaged by the University of Tasmania (UTAS) to prepare an Environmental Site Assessment (ESA) for the land impacted by a proposed pedestrian-cycle bridge development at the UTAS Invermay Campus.

The proposed bridge, herein referred to as the 'the site' will occupy small areas on the northern (approximately 150 m²) and southern side (approximately 190 m²) of the North Esk River located in Launceston Tasmania. The site occupies the river bank and nature strip on either side of the river and part of 21 Boland Street on the southern side and 6 Barnards Way Inveresk, Invermay on the northern side. The construction of the bridge will also involve the advancement of supporting piles at two locations in the river channel. The majority of the site is Department of Primary Industries, Water and Environment (DPIPWE) Crown Land and consists of a nature strip on either side of the North Esk River. The site also occupies part of title references 174633/2 on the north shore and title reference 144355/1 and 31568/2 on the southern shore. A Site Location Plan which indicates the land parcels, likely area of soil disturbance and sample locations is provided in Figure 1 (Appendix A).

The land adjacent to the site on the northern shore currently hosts multiple uses, with the UTAS campus consisting of open communal areas, campus buildings, pedestrian pathways and carparks (PID- 174633/2). On the southern side of the river, the land is mainly local government or Crown Land owned and represented by a nature strip and access road. There is also a parcel of land owned by UTAS, which is currently used as an Automobile Museum and carpark. The site is subject to a development application as UTAS intends to construct a pedestrian and bicycle bridge.

The potentially contaminated land code (E2.0) of the *Launceston Interim Planning Scheme 2015* will apply to the development application. Clauses E2.5.1 (use of land) and E2.6.2 (excavation of land) are relevant. Specifically, the performance criteria require that the land is suitable for the intended use, having regard to:

- an environmental site assessment that demonstrates there is no evidence that the land is contaminated
- an environmental site assessment that demonstrates that the level of contamination does not present a risk to human health or the environment
- a plan to manage contamination and associated risk to human health or the environment that includes:
 - an environmental site assessment
 - any specific remediation and protection measures required to be implemented before any use commences; and
 - a statement that the land is suitable for the intended use.

This report presents the findings of a Phase 1 ESA and includes a review of all available site and off-site environmental information to identify potentially contaminated areas and specific contaminants of concern that may require further investigation.

1.2 Objectives

The objective of the Phase 1 ESA was to assess the likelihood of contamination at the site and determine:

- If the land is suitable for the proposed development
- If any site contamination is likely to present a risk to workers involved in redevelopment of the site, or future users of the site
- If any site contamination is likely to present an environmental risk from excavation conducted during redevelopment of the site: and
- If any specific remediation and/or protection measures are required to be implemented before use or excavation commences.

1.3 Scope of work

The ESA was carried out in accordance with the National Environment Protection (Assessment of Site Contamination) Measure 1999 ('NEPM' - amended 2013). The scope of work included the following.

- Review of all available sources of information to compile a site history
- Review available site plans, historical maps and aerial photographs
- A review of past users of the site, and nearby sites to determine historical activities relevant to potential contamination; and
- Review historical environmental records for the site to confirm any incidents or issues that may have given rise to localised soil or groundwater contamination.

2. Site Setting

2.1 Site identification

Most of the site occupies Crown Land, with small areas occupying part of several titles on the northern and southern river shore. Details of the site are summarised in Table 1 and the title reference for the surrounding parcels of land are indicated on the Site Location Plan in Appendix A.

Table 1: Site Details

	Site Details
Street addresses	6 Barnards Way, Inveresk, Invermay TAS 7250 21 Boland Street, Launceston TAS 7250 DPIPWE Crown Services Land Local Government Authority Land
Property IDs	3389971, 6675498, 1844555
Title references	174633/2, 144355/1, 31568/2, 144356/1
Site area	Bridge footbridge approximately 1000m ² (Final design/footprint TBC)
Owner	UTAS, DPIPWE, Local Government Authority, Crown Land Services
Local Government Area	Launceston City Council
Zoning	Particular Purpose (Inveresk Site), Open Space, Urban Mixed Use
Current land use	River foreshore nature strip, pedestrian walkway university campus, automobile museum and carpark

2.2 Current and proposed land use and zoning

No known activities are currently undertaken on the site and it is largely represented by undeveloped river foreshore. A concrete slab is located on the southern shore close to the proposed bridge. It is understood that the slab relates to a demolished building, which was used by Scotch/Oakburn Collage Rowing Club before they relocated to another building approximately 20 m to the east.

Under the Launceston Interim Planning Scheme 2015, the site is zoned Particular Purpose (Inveresk Site), Open Space and Urban Mixed Use.

UTAS is proposing to construct a pedestrian cycle bridge over the North Esk River. The proposed bridge will be constructed in a two-stage process. Stage one will entail construction from the north landing bank/platform spanning to the northern side of Boland Street. Stage one will also include pedestrian connections to the existing shared pathways. Stage two will complete the bridge link over Boland Street and connect to a mid-level floor on the proposed Willis Street Campus building.

It is expected that no excavation will occur on the northern side of the bridge. Minimal excavation will be required on the southern side at each landing. It is not expected that excavation will extend beyond 1 m in depth.

2.3 Surrounding land use

Referring to the Launceston Planning Scheme 2015, the land to the north of the site is zoned 'Particular Purpose'. The land to the south of the site is zoned 'Open Space with Commercial' and 'Inner Residential' beyond to the east, and 'Urban Mixed Use' beyond to the west. The North Esk River runs through the site and is zone 'Environmental Management'.

The site is surrounded by a mix of light commercial, residential and open parkland uses:

- East: North Esk River with the row club building, Boland Street and Becks Home Timber and Hardware and residential properties approximately 200 m beyond
- West: North Esk River with UTAS student accommodation, an open storage area, education building and carparking. Invermay Road, retail shops and residential properties are located approximately 250 m beyond
- North: Queen Victoria Museum with the University of Tasmania Inveresk Campus beyond; and
- South: Boland Street with open space, parking, with the National Automobile Museum of Tasmania, Crystal Cleaning approximately 100 m beyond.

2.4 Geology

As identified in The LIST¹, the Mineral Resources Tasmania (MRT)² Geological Polygons, 1:25,000 mapping, indicated the following geological units at the site:

- The northern shore and to the east of the site on the southern shore is defined as Quaternary estuarine deposits of clayey silty, sand and subordinate gravel, supra-estuarine swamps and laterally derived alluvial deposits, unmapped man-made deposits including silt dredgings; in environments inferred to lie above frequent tidal influence (Qhiv); and
- The southern shore is defined as undifferentiated Quaternary sediments (Q).

A concealed fault is indicated trending approximately the same alignment as the proposed footbridge in a north-west to south-east orientation. Anecdotal evidence suggests that material used to construct the levees was derived from a nearby quarry, however this could not be confirmed in the historical records.

2.5 Topography and hydrogeology

From a survey of the bridge construction area undertaken on 27 March 2018 (ref L17236) the site is at an elevation ranging from 0 to 4 m Australian Height Datum (AHD). The river banks sloped into the river channel on either side of the river. Groundwater onsite is located within the North Esk River catchment and taking into account the proximity of the river, groundwater is anticipated to flow to the south on the southern side and to the north on the northern side. The North Esk River discharges into the River Tamar approximately 1.4 km to the south-west of the site.

2.6 Surface water and site drainage

A small concrete slab is located on the southern shore and the river foreshore vegetated. Levees on either side of the river direct any surface runoff adjacent to the channel towards river. In the site's observed state, surface runoff is likely to be infrequent, however the North Esk River does experience regular flood events, which would inundate the site.

1 <https://maps.thelist.tas.gov.au/listmap/app/list/map>

2 <http://www.mrt.tas.gov.au/portal/digital-geological-atlas-1-25000-scale-series>

2.7 Groundwater

A search of the DPIPWE Groundwater Information Access Portal (accessed 23 November 2018) indicated no registered groundwater bores within a 2 km radius of the site. The nearest registered bores, 41750 and 41502 are located approximately 3.1 km and 3.3 km respectively to the south-west of the site. Bore 4175 is registered as abandoned as has a recorded depth of 30 m. Bore 41502 is also listed as abandoned and has a recorded depth of 100 m. Taking into account the surrounding topography and proximity to the river channel, groundwater is anticipated to be shallow (within 2 m below the ground surface).

2.8 Flora and fauna

According to TASVEG 3.0 mapping, the vegetation community on the northern river foreshore would be classified as 'agricultural, urban and exotic vegetation' (FWU), with a vegetation community description of 'weed infestation'. Vegetation beyond the river foreshore on the northern bank and the southern side of the river within the site is classified as 'agricultural, urban and exotic' species (FUR) with a vegetation community description of 'urban areas'. The site does not support and vegetation larger than low lying grasses and shrubs, consistent with earthworks which would have occurred during the construction of the levees.

A flora and fauna assessment³ was undertaken at the site of the proposed development. The flora and fauna assessment confirmed that vegetation along the banks of the North Esk River consists of highly disturbed riparian vegetation. The findings of the survey were as follows:

- No Threatened Ecological Communities identified under either the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or the *Tasmanian Nature Conservation Act 2002* (NC Act) was recorded in the Study Area
- No threatened flora as listed under either the Commonwealth EPBC Act or the Tasmanian Threatened Species Protection Act 1995 (TSP Act) were recorded within the Study Area. Assessment of available habitats using the results of the field survey indicates that due to historic disturbance associated with urban development in the Study Area, threatened flora species are considered unlikely to occur
- Three declared weeds, as listed under the *Weed Management Act 1999* (WM Act), were identified: crack willow, blackberry and Paterson's curse; and
- No threatened fauna was recorded within the Study Area, during the field survey. The proposed development will not impact any critical habitat elements for any threatened species identified with potential to occur including Tasmanian wedge-tailed eagle, grey goshawk, white-bellied sea-eagle, Australasian bittern or the fish species Australian grayling.

2.9 Acid sulfate soils

The Tasmanian Acid Sulfate Soils Information (TASSI) database accessed via the LIST, identified coastal acid sulfate soil ASS (0-20 m AHD zone) on the site. The northern river shore, and a strip on the southern shore close to the river, had a high probability of costal ASS occurrence. This equates to a >70% chance of occurrence with ASS generally within upper 1 m. No excavation will occur in these areas.

The remainder of the site on the southern side of the river had a low probability of costal ASS occurrence, which corresponds to a 6-70% chance of occurrence. Minimal soil excavation is proposed in these areas, therefore no specific management measures are considered necessary.

³ *University of Tasmania Proposed Footbridge Flora and Fauna Assessment Report (R01)*. Prepared by Umwelt (Australia) Pty Ltd on behalf of Pitt&Sherry, February 2019

3. Historical Review

Information on the history of the site and surrounding land was obtained from the following sources:

- Historical aerial photographs
- Property Information Request from the Contaminated Sites Unit of the Tasmanian EPA which included historical dangerous good registered with Workplace Standard Tasmania (WST); and
- Existing reports from previous assessments and remediation works carried out at the Invermay site.

3.1 Aerial photography

To determine past activities and land use at and near the site five historical aerial photographs and one current aerial photograph was examined (Table 2). The photographs dated from 1973 to the present day and copies of the photographs are provided in Appendix B.

Table 2: Review of historical photographs

Item	Date and scale	Observations
Photo 1	14/11/1973 1:15,500	The northern part of the site consists of the river bank, nature strip and the Launceston Railyard beyond. The southern part of the site consists of the river bank with a rectangular building to the east (where the rowing club is now located). <u>Surroundings:</u> The site adjacent to the south appears to be used as a rail storage area. The Launceston Gasworks is located to the south on Willis Street between Boland Street and Cimitiere Street. The Launceston Railyard to the north of the site occupies a large area, with residential housing beyond to the west.
Photo 2	22/11/1982 1:6,200	No significant changes are observed in the northern and southern portions of the site on either side immediately adjacent to the river bank. The rectangular building on the southern nature strip remains. <u>Surroundings:</u> Many of the rail carts and other items appear to have been removed from the storage yard to the south of the site. On the Gasworks site to the west, some of the storage tanks appear to have been demolished, however it is difficult to determine the extent of these changes due to the low resolution of the photograph.
Photo 3	26/02/1992 1:12,500	No significant changes are observed across northern and southern portions of the site immediately adjacent to the river bank. A second rectangular building on the southern nature strip appears to have been constructed to the west of the existing building. <u>Surroundings:</u> Many of the buildings in the Launceston Railyard to the north of the site appear to have been demolished. The site to the north of the railyard appears to now be used for recreational use. Infrastructure associated with the rail sidings to the south of the site appear to have been removed. Infrastructure and buildings on the Gasworks site to the west appear largely unchanged.
Photo 4	25/11/1997 1:12,500	The northern portion of the site appears to have been levelled following the demolition of the Railyards. The southern portion of the site appears to be largely unchanged. <u>Surroundings:</u> Buildings and infrastructure associated with the Launceston Railyard to the north of the site appear to have been removed and the land adjacent to the river nature strip is largely vacant. Vehicle parking and open space is present to the north beyond. The road following the southern river bank (now Boland Street) appears to have been sealed. A building appears to have been constructed to the south of the site and cars

Item	Date and scale	Observations
		appear to be parked in a triangular shaped parking area. Buildings and infrastructure at the Gasworks to the west appear to be largely unchanged.
Photo 5	08/03/2009 1:7,000	The northern portion of the site beyond the river nature strip remains vacant. The southern portion of the site appears to be largely unchanged. <u>Surroundings:</u> The land adjacent to the river nature strip remains vacant. Trees have been planted surrounding the parking areas and open space to the north beyond. Trees have also been planted on the adjacent site to the south on the southern side of the river. The tanks associated with the Gasworks now appear to have been demolished, although part of the structure on one tank in the south western corner appears to remain. A large building has been constructed on the northern site boundary which is now occupied by a Centrelink Service Centre.
Photo 6	Current State Aerial Photography	A shared walking and cycle path appears to have been constructed along the northern river bank adjacent to the nature strip. The rectangular building on the southern portion of the site appears to have been demolished and the concrete slab remains. <u>Surroundings:</u> The UTAS student accommodation block has been constructed on the formally vacant land to the north of the site. Trees to the north and south of the site have become established. The former Gasworks site to the south appears to be largely unchanged.

The review of historical aerial photographs indicated that the locations where excavation is proposed onsite has not undergone significant changes since 1973. However, significant changes primarily from heavy industrial to light industrial, high density residential and open space use is observed on nearby sites. Contamination associated with historical industrial activity on nearby sites has the potential to migrate offsite and is therefore required to be considered.

3.2 Planning and regulatory review

3.2.1 EPA Property Information Request

The review of historical aerial photographs indicated that the locations where excavation is proposed onsite has not undergone significant changes since 1973. However, significant changes primarily from heavy industrial to light industrial, high density residential and open space use is observed on nearby sites. Contamination associated with historical industrial activity on nearby sites has the potential to migrate offsite and is therefore required to be considered.

2 Invermay Road, Invermay (PID 3389971)

Number 2 Invermay Road is situated on the northern side of the river and was historically the location of the Launceston railyards and workshops, Pioneer Concrete works and sporting grounds. The EPA listed a number of reports and documents r included an Environmental Audit, several Contamination Assessment Reports and a Site Management Plan.

In addition to the above, several records were located by the EPA which related to neighbouring properties. The details of these records are summarised below:

- **129-139 Invermay Road** – Historical Work Safe Tasmania (WST) records indicate dangerous goods were stored in underground storage tanks at the property between 1949 and 1960. The EPA was notified of an incident in 1999 and approval to remove contaminated soil was given in 2000. Currently an operational United Petroleum Service station is located on the site, with underground petroleum storage tanks (UPSS) with a combined capacity of 85,000L
- **103 Invermay Road** – A Coles Express Service station was registered in 2010 with six UPSS. The EPA subsequently received advice that three tanks were removed, and one was decommissioned in situ in 2011 due to leaking. A remediation notice was issued in 2013 and was revoked in 2014
- **3-11 Dry Street** – A Caltex Petrol Station was registered in 2010 with three UPSS. Two UPSS were reported to have been removed in 2015
- **32-38 Invermay Road** – A Caltex Service Station with four UPSS and a combined capacity of 89,000 L are registered; and
- **1-9 Lindsay Street (Scottsdale Levee)** – A Management Notice (8655/1 relating to the burial of approximately 300 m³ of hydrocarbon contaminated soil is registered on the property. EPA are in possession of the following report entitled 'Summary Report - Burial of PAH Contaminated Soil Scottsdale Levee', dated October, prepared by pitt&sherry.

86 Cimitiere Street, Launceston and associated land (certificate of Title 144356/1, 144355/1 and 31568/2) on the southern shore

86 Cimitiere Street is situated on the southern shore and is in a former light industrial area adjacent to the former Launceston Gasworks site and service stations. The EPA received a number of reports in 2006 as part of a development application including a ground investigation, health risk assessment and site management plan. The EPA provided comment on the reports and advised that Site sign off would not be granted until a signed agreement between the Launceston City Council and the landowner was received. No further records for the Site were located.

The former Launceston Gasworks site was located to the west of 86 Cimitiere Street on Willis Street. EPA report that they have an extensive number of reports relating the coal gas production at the site which ceased in 1996 and the site was decommissioned and rehabilitated between 1999 and 2007. An Environmental Protection Notice (EPN) 696/1 was issued in 2003 to regulate the soil and groundwater environmental works. The contaminants of concern include polycyclic aromatic hydrocarbons (PAHs), benzene, toluene ethylbenzene and xylene (BTEXN), total petroleum hydrocarbons (TPH), phenols, ammonia and cyanide associated with tar and other liquid wastes. Following a request, the EPA agreed that groundwater monitoring could cease in 2007 and the EPN was withdrawn.

In addition, several records were located by the EPA which related to neighbouring properties. The details of these records are summarised below:

- **68-76 Cimitiere Street** – hosted a Shell City Park Service Station. This ceased trading and infrastructure was removed between 1996 to 1999. EPA was also in possession of a site validation report and a development application which was submitted to Launceston City Council
- **4-6 Boland Street** – EPA received a decommissioning form for the removal of an UPSS in 2018. No contamination concerns were raised; and
- **13 Tamar Street and 15-21 Tamar Street** – Historic WorkSafe Tasmania records indicate between 1947 and 1956 dangerous goods were stored in underground tanks.

In August 2018, EPA approved the disposal of nearly 5,000 T of low-level contaminated soil excavated during streetscape works in Cimitiere Street. Level 2 petroleum hydrocarbon and leachable PAH including benzo(a)pyrene.

3.2.2 Dangerous Goods Register

Historical records of dangerous goods for the surrounding sites was provided in the PIR issued by the EPA and summarised in Section 3.2.1. No records of dangerous good storage or other relevant information was indicated for the site.

3.3 Hobart City Council Records

Taking into account the detailed information on potentially contaminating activities and history of contaminated sites surrounding the investigation area, no records were directly requested from Hobart City Council. In addition, Council does not hold any records of environmental incidents that may have caused localised environmental nuisance or harm and impact on future use or users of the site.

4. Previous assessments

A number of environmental reports exist which document environmental assessment and site remediation works undertaken on the Invermay side of the development, prior to redevelopment of the Inveresk Railyards. All known existing reports have been listed in Section 10.

The description and outcomes of these investigations have been summarised below.

4.1 Inveresk Railyard

Information was mostly gained from the following two reports:

- *Inveresk Railyard, Status of Site Remediation*. Prepared by SEMF for Launceston City Council in November 1999; and
- *Contamination Site Assessment (Tier 1 – Screening Level) – UTAS Inveresk Residences, Invermay*. Prepared by Geoton Pty Ltd for Morrison & Breytenbach Architects on 11 August 2014.

The Inveresk railway workshops were established in 1868 to service steam locomotives. The site was used for the industrial production and maintenance of rolling stock over the period up to the 1990's. The diesel workshop was constructed during the 1950's, when the transition from steam to diesel powered locomotives occurred. The rail yards were also used for a short period for the production of munitions during the Second World War.

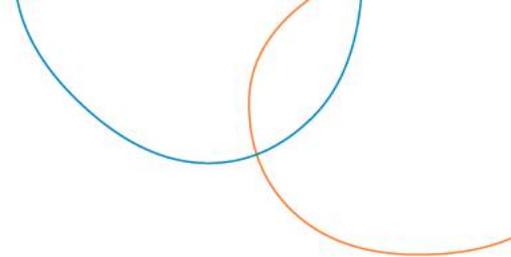
In the 1990's, the Inveresk Railyard site was redeveloped for the purposes of public facilities, including an annex of the Queen Victoria Museum, the Launceston Campus of UTAS and the Royal Launceston Show Society. As part of the site's redevelopment, a comprehensive site assessment and subsequent site clean-up and management programs were undertaken, due to the site-wide contamination of soil and groundwater with metals and hydrocarbons.

The following remediation and management measures were implemented at the site:

- Soil excavation: certain areas of the site were extensively contaminated with hydrocarbons. These soils were excavated and remediated by landfarming followed by site reuse or off-site disposal (Remount Road Landfill)
- Capping: areas of hydrocarbon and metal contamination were managed by installation of a barrier such as clean soil (minimum of 300 mm), car parks, paving and sealing. Any fill brought to site was from a known location to ensure it was not contaminated
- Groundwater monitoring and remediation: nine groundwater monitoring bores were installed in 1995, with monitoring undertaken on a six-monthly basis. Groundwater was found to be significantly contaminated with hydrocarbons, including free phase hydrocarbons. Groundwater was pumped from excavations to a sedimentation bay located on site and treated through an oil water separator prior to discharge of the treated water to sewer. Groundwater was not remediated over the entire site
- Prevention of off-site migration of contamination: the prevention of the off-site migration of both air and water borne contamination was achieved by a number of site specific measures such as paving of contaminated areas, control of stormwater on the site, dust generation control and removal of contaminated materials from the site; and
- Underground fuel tanks: two UST's were located at the northern end and south of the diesel workshops. The northern UST and approximately 50m³ of hydrocarbon contaminated soil were removed. The southern UST was decommissioned in situ, as no apparent contamination was present.

The southern area adjacent to the river was subsequently assessed in 2014 before construction of the UTAS student accommodation [Geoton report]. The assessment identified lead and polycyclic hydrocarbon contamination in soils, at concentrations higher than the assessment criteria for the protection of human health for residential use (and recreational use). Groundwater sampling and assessment was not undertaken as part of the contamination site assessment; however, groundwater seepage was encountered in several boreholes at depths of between 0.5 m and 0.6 m. Taking account the close proximity of the investigation area to the site groundwater is likely to be shallow (>1 mBGL).

pitt&sherry comment: the site remediation status report documents the excavation and onsite treatment (via landfarming) of soil impacted with TPH and metal. When the levels of TPH were at appropriate levels, the material is reported to have been reused in the amphitheatre area of the site, which is used for vehicle parking and open public space. The report does not indicate that any treated soil was placed near the river bank in the vicinity of the site. Significant hydrocarbon impacted water has historically been identified on the Inveresk Railyard site. Although groundwater remediation (by pumping and treatment prior to discharge to sewer) is stated, there is potential for offsite migration onto the site to have occurred and for impacted groundwater to be encountered.



5. Soil sampling and site inspection

5.1 Investigation methodology

A site inspection and shallow soil sampling with a hand auger were undertaken on 12 November 2018. Soil samples were collected from each of the five locations where soil excavation is likely to occur. A sample location plan is provided in Appendix A. One sample (BH-A) was located on the northern river bank, and the remaining four samples (BH-B, BH-C, BH-D and BH-E) were located on the southern river bank and flat grassed area adjacent to it.

5.2 Ground conditions

The sample details and description of the soil encountered is summarised in Table 3.

Table 3: Shallow soil sampling summary

Sample ID	Site Details	Sample depth (m)	Sample description
BH-A	12/11/2018	0.66	Stiff orange, black clay
BH-B	12/11/2018	0.5	Black silt. C and D waste on banks
BH-C	12/11/2018	0.15	Gravelly loam/topsoil with bitumen fragments
BH-D	12/11/2018	0.15	Gravelly topsoil with bitumen fragments
BH-E	12/11/2018	0.25	Dark brown loam/topsoil, no gravels

Photographs taken during the inspection are provided in Appendix D.

5.3 Site inspection observations

The following observations were made during the site inspection:

- Brick fragments were observed on the southern portion of the site on the lower part of the bank adjacent to the water. Although the source of the brick is unknown, it could be associated with demolition of the nearby building
- The top of the levee along the southern side of the river was covered in bitumen. Three small areas of excavation are anticipated on each side of the levee (soil assessed in samples BH-C, BH-D and BH-E; Appendix A)
- No visual indications of contamination were observed throughout the site, such as impacted vegetation, staining or observed potential asbestos containing materials; and
- Access for collection of samples BH-A and BH-B (refer to sample location plan in Appendix A) was difficult due to the infestation of tall weeds along the banks. Sampling was restricted to areas of hard ground. The areas close to the river were very silty and soft and could pose a potential safety hazard during site works.

5.4 Chemical analysis

Soil samples were collected and dispatched (in chilled containers) under a chain of custody documentation to Australian Laboratory Services (ALS) in Springvale, VIC. The laboratory met in-house compliance under their quality assurance programs and is accredited by the National Association of Testing Authorities (NATA) for all analysis undertaken (where required). In addition, the laboratory performed inhouse quality assurance/quality control (QA/QC) programs. All soil samples were analysed for a comprehensive suite of determinates, which included:

- Metals
- Total petroleum hydrocarbons (TPHs)
- Polycyclic aromatic hydrocarbons (PAH)
- Benzene, toluene ethylbenzene, xylene (BTEX)
- Polychlorinated biphenyls (PCBs)
- Organochlorine pesticides (Ops); and
- Phenols.

No field QA/QC intra-laboratory, inter-laboratory, rinsate, field blank or trip blank samples were collected. Taking into account that soil sampling was undertaken to provide a preliminary indication of contaminant concentrations in areas likely to be disturbed, field QA/QC sampling was not considered to be the necessary.

If additional sampling is required for assessment or waste classification purposes, QA/QC sampling should be undertaken in accordance with the National Environmental Protection (Assessment of Site Contamination) Measure 1999 (NEPM 1999) and/or Tasmania Waste Classification (Version 3 2018) guidelines. The results of the chemical analysis are summarised in Table 4 and analytical reports are included in Appendix D.

Table 4: Summary of analytical results (mg/kg)

Analyte	Minimum concentration	Maximum concentration	Maximum total concentration Level 2 ⁽¹⁾	Sample locations exceeding criteria
Metals				
Arsenic	LOR	12	200	None
Barium	20	120	3,000	None
Beryllium	LOR	LOR	40	None
Cadmium	LOR	LOR	40	None
Chromium (total)	20	97	500	None
Chromium (IV)	LOR	LOR	200	None
Cobalt	LOR	26	200	None
Copper	9	60	2,000	None
Lead		3,000	1,200	BHE – 3,000 mg/kg
Manganese	36	593	5,000	None
Mercury (total)		0.4	30	None
Nickel	8	119	600	None
Selenium			50	None
Zinc	37	200	14,000	None
PAHS				
Benzo(a)pyrene	LOR	2.88	2	BHE – 2.8 mg/kg
Total PAHS	LOR	19.3	40	None

Analyte	Minimum concentration	Maximum concentration	Maximum total concentration Level 2 ⁽¹⁾	Sample locations exceeding criteria
TRH/BTEXN				
TRH C-6-C9	LOR	LOR	650	None
TRH C-10-C36 Fraction (sum)	LOR	LOR	5,000	None
Benzene	LOR	LOR	5	None
Toluene	LOR	LOR	100	None
Ethylbenzene	LOR	LOR	100	None
Xylene	LOR	LOR	180	None
Other				
Cyanide	4	LOR	4	None
Fluoride	150	70	3,000	None
Total PCBs	LOR	LOR	20	None
Sum of aldrin + dieldrin	LOR	LOR	200	None
Phenols	LOR	LOR	500	None

1. EPA Information Bulletin Number 105 (2012) Low Level Contaminated Soil – Level 2
2. Only contaminants with applicable criteria have been included
3. Limit of reporting (LOR)

For the purpose of the preliminary waste classification assessment, the sample collection, documentation, handling, storage and transportation procedures utilised were of an acceptable standard and the analytical results provided by the laboratories are deemed reliable and complete.

5.5 Preliminary assessment of analytical results

The soil analytical results were compared against the EPA Tasmania Classification and Management of Contaminated Soil for Disposal Guidelines – Information Bulletin Number 105 (Version 3 2018). With the exception of sample BH-E, all the analytical results were below the Low Level Contaminated Soil – Level 2' criteria. Concentrations of benzo(a)pyrene (2.88 mg/kg) and lead (3,000 mg/kg) were detected in sample BH-E above the respective Maximum Total Level 2 criteria.

Total Characteristic Leaching Procedure (TCLP) extraction and benzo(a)pyrene and lead analysis was subsequently scheduled on sample BH-E to allow classification against the maximum TCLP concentration criteria, which take precedence over the maximum total concentration. The TCLP benzo(a)pyrene concentration was below the LOR and the Level 2 waste criteria, however the TCLP lead concentration was 2 mg/L, which exceeded the 0.5 mg/L Level 2 TCLP maximum. Based on the TCLP analysis sample BH-E classifications remains as Contaminated Soil - Level 3.

6. Summary of potential contamination

Based on the review of available records, with the exception of the construction of the levees, no potentially contaminating activities have been identified to have occurred on site. The source of the material used to construct the levees is unknown, however anecdotal information suggested that it may have been derived from a nearby quarry. Aerial photographs indicate a small building on the southern bank was demolished between 2009 and 2018. The building may have contained hazardous materials, such as asbestos or lead paint, which may have been distributed in the surrounding area during the demolition process.

Based on the surrounding commercial/industrial land use, and the levees which required material to be imported onto the site, it is possible that contaminated soil and or groundwater may be present onsite.

The potentially contaminating activities that have been identified at the site and on adjacent land have been summarised in Table 5 and

Table 6 and a sample location plan is provided in Appendix A.

Table 5: Summary of potential sources of contamination at the site

Potentially contaminating activities	Potential contaminants	Media
Imported fill used to construct the levees and covering the site	Metals, hydrocarbons, PAHs, BTEX, PCBs, phenols	Soil
Demolition of small building	Asbestos, lead paint	Soil
Application of pesticides to control invasive weeds	Organochlorine Pesticides	Soil

Table 6: Summary of potential off-site historical sources of contamination

Address	Site activities	Potential contaminants of concern	Potentially affected media
2 Invermay Road	Launceston Railyards and workshops, concrete works, sporting grounds	TPH, BTEX, metals, PAHs, asbestos, OP, PCBs	Soils and groundwater
129-139 Invermay, 3-11 Dry Street Road, 32-38 Invermay Road	Petroleum Service Station	TPH, BTEXN, lead, PAHS	Soils and groundwater
1-9 Lindsay Street	Burial of hydrocarbon contaminated soil in levee	PAH, BTEXN	Soils
86 Cimitiere Street	Former light industrial area	Asbestos contaminants from adjacent sites	Soils and groundwater

7. Risk Assessment

7.1 Preliminary conceptual site model

A preliminary Conceptual Site Model (CSM) has been developed based on pitt&sherry's understanding of the site setting, in order to identify potentially significant source-pathway-receptor linkages with regard to human health and the environment (Figure 1).

Potential sources of on-site and off-site contamination and associated contaminants of concern have been identified in Table 5 and

Table 6. Contamination which may potentially be present at the site are as follows:

- Contaminants in soils and subsoils from imported material to construct the levees, from unreported site activities or uncontrolled imported fill (hydrocarbons, BTEXN, metals, PAHs, asbestos); and
- Contaminants in groundwater from previous past industrial activities Launceston Gasworks, UPSS, burial of contaminated soils, Launceston Railyards and workshops, concrete works (hydrocarbons, BTEXN, metals, PAHs, polychlorinated biphenyls (PCBs)).

Taking into account water ingress observed on nearby sites, groundwater depth is likely to be less than 2 m bgl with a flow direction towards the river channel.

The TASSI database indicated that the site has a high (>70%) chance of coastal ASS occurrence on the northern shore and a low to high (6% to 70%) chance on the southern shore. The human health and environmental risks associated with ASS disturbance are therefore required to be considered, in addition to contaminants.

Human receptors identified for the site are:

- Current recreational site users (members of the public)
- Future site users: (members of the public); and
- Workers during the construction of the bridge or during development works.

Off-site identified ecological receptors are:

- Aquatic ecological receptors (flora and fauna) in North Esk River (which dissects the site); and
- Derwent Estuary (1 km).

No site terrestrial ecological receptors (flora and fauna) have been identified due to the absence of identified protected species and limited current or future vegetation.

The identified potential pathways by which human receptors may be exposed to contaminants are:

- Direct contact (dermal contact/ingestion) with contaminants in surface soils and/or sub-surface soils (construction workers)
- Inhalation (dust inhalation or hydrocarbon vapours) with contaminants in surface soils and/or sub-surface soils (construction workers); and
- Inhalation of hydrocarbons from contaminated groundwater (all users).

The identified potential pathways by which ecological receptors may be exposed to contaminants are:

- Migration of contaminated groundwater.

7.2 Preliminary risk evaluation

The Preliminary Conceptual Site Model graphically displayed in Attachment 1 seeks to identify possible pollutant linkages which may eventuate due to the disturbance, excavation and removal of soil during the proposed bridge construction works. The likely risks are assessed on a qualitative basis according to a 'source-pathway-receptor approach'. Risks are classified as 'low and acceptable' or 'potential risks'. The adopted risk categories are defined as follows:

- **Low acceptable Risks** – it is considered unlikely that the identified pathway represents a significant risk; and
- **Potential Risks** – there is a possibility that the identified pathway represents an unacceptable risk requiring further investigation and/or the implementation of mitigation control measures.

Based on the desktop information gathered, the limited shallow soil sampling and the Preliminary Conceptual Site Model, the risk to the each of the identified receptors has been assessed as follows:

- **Risk to construction workers:** workers engaged in construction activities may potentially be exposed to contaminants in surface soils and sub-soils during excavation. Workers carrying out excavation work may also potentially be exposed to hydrocarbon vapours from contaminated soil and/or groundwater (if present). The risk to construction workers from contaminated soil is considered low based on the limited soil sampling undertaken and implementation of a Construction Environmental Management plan (CEMP) which should be prepared prior to any soil disturbance or soil excavation. The CEMP should include protection measures for workers and management measures for potentially contaminated soil.
- **Risk to current and future site users:** the risk to site users by direct contact with contaminated soil is considered to be low based on the understanding that excavated soil will be removed offsite and any freshly exposed soil after the development will be revegetated. However, the desktop study and preliminary sampling indicated the potential for soil and/or groundwater contamination to be present onsite, excavated soil should be treated as potentially contaminated and appropriately stored until visually inspected and tested by a competent person to verify the absence of significant contamination. If soil is encountered which is not consistent with the material sampled, or there are visual or olfactory signs of contamination such as staining, discolouration or hydrocarbon odours, appropriate control should be implemented to prevent the potential spread of contamination.
- **Risk to ecological receptors:** Based on the absence of threatened or significant terrestrial flora or fauna on the site, the risk to these ecological receptors from contamination emanating from the site is considered to be low. Because the North Esk River passes through the site and piles will be advanced in the river channel, there is considered to be a potential risk to aquatic ecological receptors associated with potentially contaminated soil and/or groundwater. In addition, parts of the site have a high probability of encountering coastal ASS within the upper 1 m. The northern river shore, and a strip on the southern shore close to the river, have a >70% chance of occurrence. However, no excavation will occur in these areas. The remainder of the site on the southern side of the river have a low probability of coastal ASS occurrence, which corresponds to a 6-70% chance of occurrence. Minimal soil excavation is proposed in these areas and no ASS management plan is considered necessary. However regular visual monitoring of the works area to identify signs of ASS oxidation should be included in the CEMP.

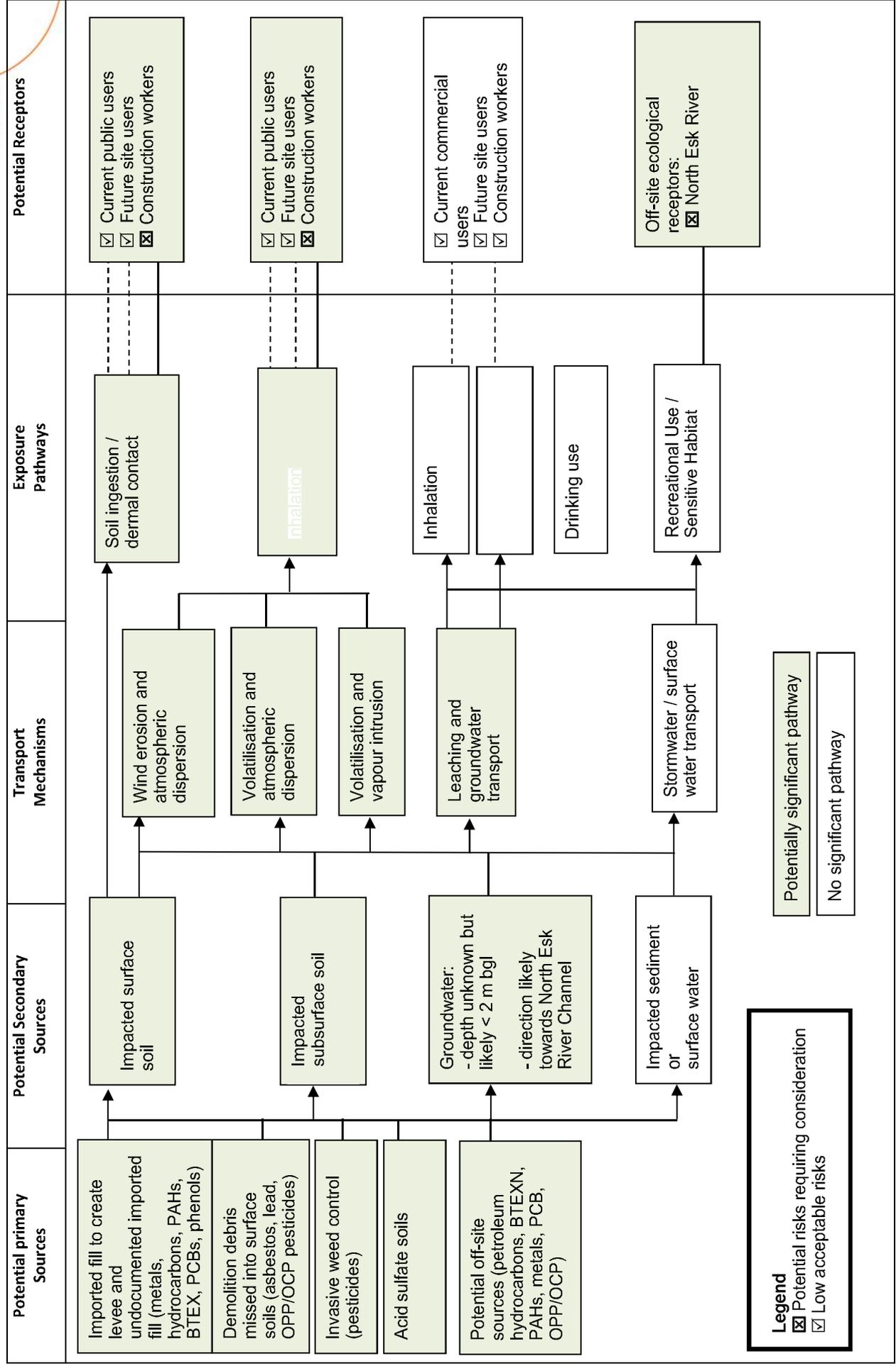


Figure 1: Preliminary conceptual site model

8. Uncertainties and data gaps

In addition to the above potential contamination linkages, some uncertainties currently exist relating to the following:

- The thickness and composition of fill associated with the levees
- The aquifer properties, the depth to groundwater and direction of groundwater flow
- The presence or absence of contaminated groundwater, which may have migrated onto the site from offsite sources; and
- The potential lateral and vertical extent of acid sulfate soils.

9. Conclusions and recommendations

This report presents the findings of a Phase 1 Environmental Site Assessment undertaken by pitt&sherry to support the construction of a proposed pedestrian-cycle bridge at the Invermay Campus, Launceston.

The assessment consisted of a site history review, site inspection and limited soil sampling and chemical analysis to identify potentially contaminated areas and specific contaminants of concern.

A summary of the information gained through this assessment is as follows:

- The site historical review indicated no contaminating activities directly associated with the site, however contaminated soil may have been transported onto the site during the construction of the flood levees
- There are no records documenting the demolition of the small building on the southern side of the river, therefore hazardous materials which may have been in the building may have been distributed in surface soils onsite
- The review of historical records indicated the presence of contamination in nearby sites and activities commonly associated with contamination. These activities included the Inveresk Railway and workshops, concrete works, UPSS, Launceston Gasworks and the burial of hydrocarbon contaminated soil; and
- The following potential contamination was identified at the site:
 - o Metals, PAH, TPHs, BTEX, PCBs, OPs and phenols.

A preliminary conceptual site model was developed based on the information gained to date and it was determined that there was a potentially significant risk to the following receptors without with implementation of appropriate controls of further investigation:

- Construction workers, due to the potential for contaminants to reside in soils and groundwater onsite; and
- Ecological aquatic receptors, due to the potential for contaminants to reside in soils and groundwater onsite.

Notwithstanding this, the identified risks are considered to be acceptable, given that:

- The limited soil sampling undertaken does not indicate significant lateral migration of offsite sources of historical contamination in shallow soils. In addition, remediation works which are reported to have been undertaken on many of the adjacent sites following the cessation of heavy industrial activities further reduces the risk of offsite migration; and
- No records of potentially contaminating activities were identified on the in the EPA PIRs.

Based on the reviewed historical information, the site inspection and limited soil sampling the implementation of the following protection measures are considered necessary to ensure that any contamination present at the site will not present an unacceptable risk to human health or the environment in relation to the proposed development:

- A Construction Environmental Management plan (CEMP) should be prepared prior to any soil disturbance or soil excavation. The CEMP should include and unexpended finds protocol and protection measures for workers in relation to encountering potentially contaminated soil and groundwater. The CEMP should also include regular visual monitoring of the works area to identify signs of acid sulfate soil oxidation.
- Due to the potential for soil and/or groundwater contamination to be present onsite, disturbed soil should be visually inspected by a competent person to verify the absence of significant contamination.
- An Unexpected Finds Protocol should be prepared and implemented where suspected contaminated or hazardous materials are encountered during excavation works.
- A Surface Water and Sediment Management Plan should be implemented prior to soil disturbance or excavation to prevent surface water or sediments from entering the North Esk River.
- Due to the variability of in-situ soil waste classification, excavated soils should be treated as potentially contaminated and appropriately stored on site until a visual inspection of the material and sampling for waste classification purposes in accordance with EPA Tasmania Classification and Management of Contaminated Soil for Disposal Guidelines have been completed.

Based on the review of historical information and ESA, and with the implementation of the above protection measures, site contamination is not considered likely to present a risk to workers or the environment.

10. Important information

10.1 Scope of services

This report (“the Report”) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and pitt&sherry (“the scope of services”). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints. The Report may only be used and relied on by the client for the purpose set out in the contract or as otherwise agreed between the client and pitt&sherry. Any use which a third party makes of this document, or any reliance on or decisions to be made based on it, is the responsibility of such third parties.

10.2 Reliance on data

In preparing the Report, pitt&sherry has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the Report (“the data”). Except as otherwise stated in the Report, pitt&sherry has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the Report (“conclusions”) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. pitt&sherry does not warrant the accuracy will not be liable in relation to conclusions should any of the data, be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to pitt&sherry.

10.3 Conclusions and recommendation

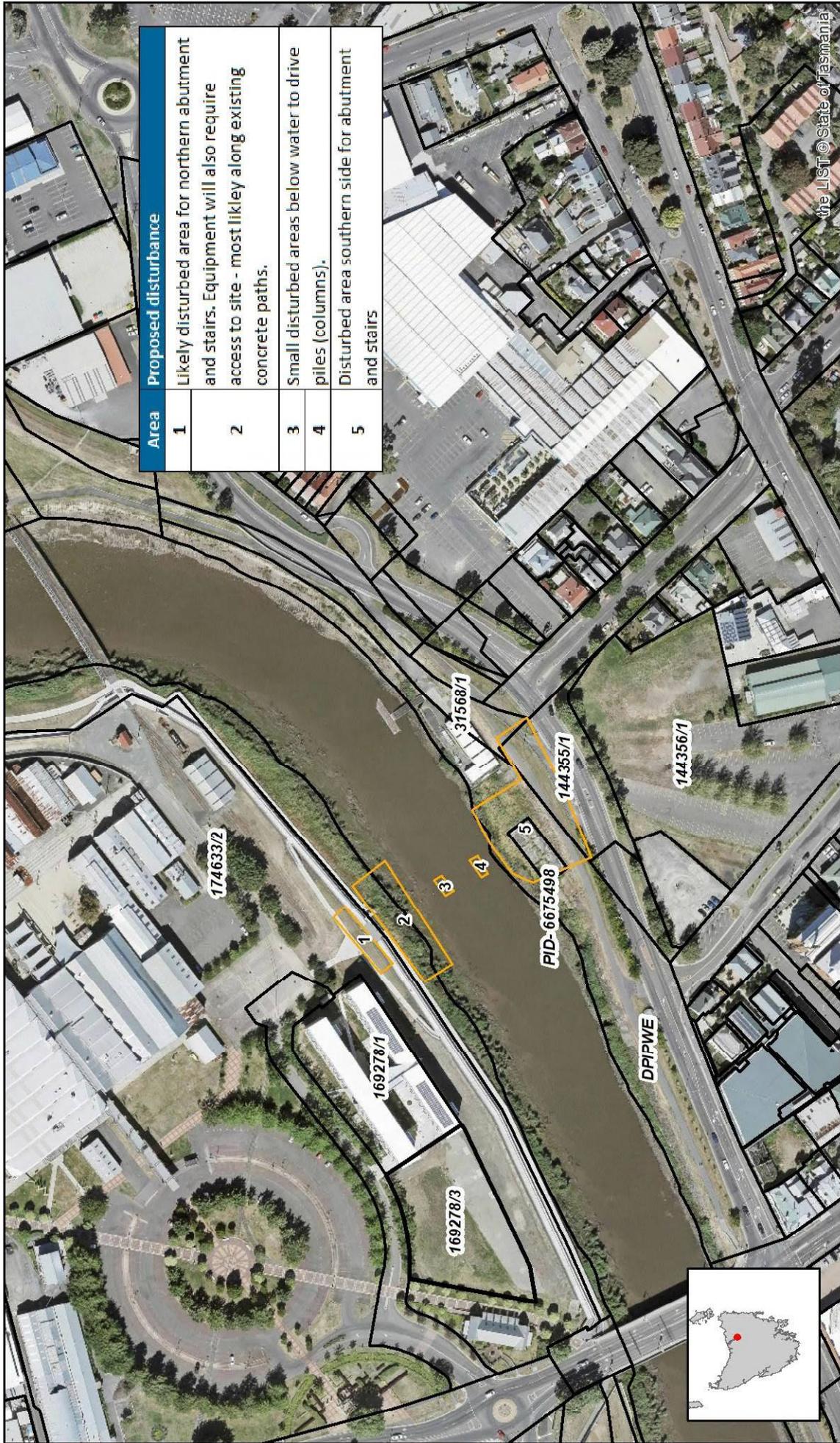
The conclusions in this Report are based on conditions encountered and information reviewed at the date of preparation of the Report. pitt&sherry has no responsibility or obligation to update this Report to account for events or changes occurring subsequent to the date that the Report was prepared.

11. References

- (2018), Environment Protection Authority Tasmania.
- Contamination Site Assessment (Tier 1 Screening Level) (2014), GeoTon Pty Ltd Geotechnical Consultants.
- Geotechnical Foundation Investigation UTAS Inveresk Residence, Invermay (2014), GeoTon Pty Ltd Geotechnical Consultants.
- Inveresk Railway Workshops Soil Stockpile Remediation Advice, (1995) Stephenson EMF Consultants Engineers and Managers.
- Inveresk Railway Workshops Development, Groundwater Monitoring Program, (1995) Stephenson EMF Consultants Engineers and Managers
- Inveresk Railway Workshops Development, Monthly Report No.11 September, October, November, December, January, February, March, Report No. 95MREP/11, (1998) SEMF Holdings Pty Ltd.
- Inveresk Railway Workshops Development, Monthly Report No.9 August, September, October, November, December, Report No. 95MREP/09, (1995) Stephenson EMF Consultants Engineers and Managers
- Inveresk Railway Workshops Development, Monthly Report No.7 January, February, March, Report No. 95MREP/07, (1995) Stephenson EMF Consultants Engineers and Managers
- Inveresk Railway Workshops Development, Monthly Report No.6 December, Report No. 95MREP/06, (1995) Stephenson EMF Consultants Engineers and Managers
- Inveresk Railway Workshops Development, Monthly Report No.5 November, Report No. 95MREP/05, (1995) Stephenson EMF Consultants Engineers and Managers
- Inveresk Railway Workshops Development, Monthly Report No.4 October, Report No. 95MREP/04, (1995) Stephenson EMF Consultants Engineers and Managers
- Inveresk Railway Workshops Development, Monthly Report No.3 September, Report No. 95MREP/03, (1995) Stephenson EMF Consultants Engineers and Managers
- Inveresk Railway Workshops Development, Monthly Report No.2 August, Report No. 95MREP/02, (1995) Stephenson EMF Consultants Engineers and Managers
- Inveresk Railway Workshops Development, Monthly Report No.1 July, Report No. 95MREP/01, (1995) Stephenson EMF Consultants Engineers and Managers
- Inveresk Railway Workshops Development, Management of Site Remediation Report No. 95/01, (1995) Stephenson EMF Consultants Engineers and Managers
- Inveresk Railway Workshops Site Redevelopment Groundwater and Soil Remediation Environmental Performance Review, (1994) Stephenson EMF Consultants Engineers and Managers
- Launceston City Council, Inveresk Railyard Status of Site Remediation, (1999), SEMF Holdings Pty Ltd; and
- National Environment Protection (Assessment of Site Contamination) Measure 1999 ('NEPM' - amended 2013).

Figures

Appendix A



Area	Proposed disturbance
1	Likely disturbed area for northern abutment and stairs. Equipment will also require access to site - most likely along existing concrete paths.
2	Small disturbed areas below water to drive piles (columns).
3	Disturbed area southern side for abutment and stairs
4	
5	

the LIST © State of Tasmania

UTAS

Site Location Plan



Legend

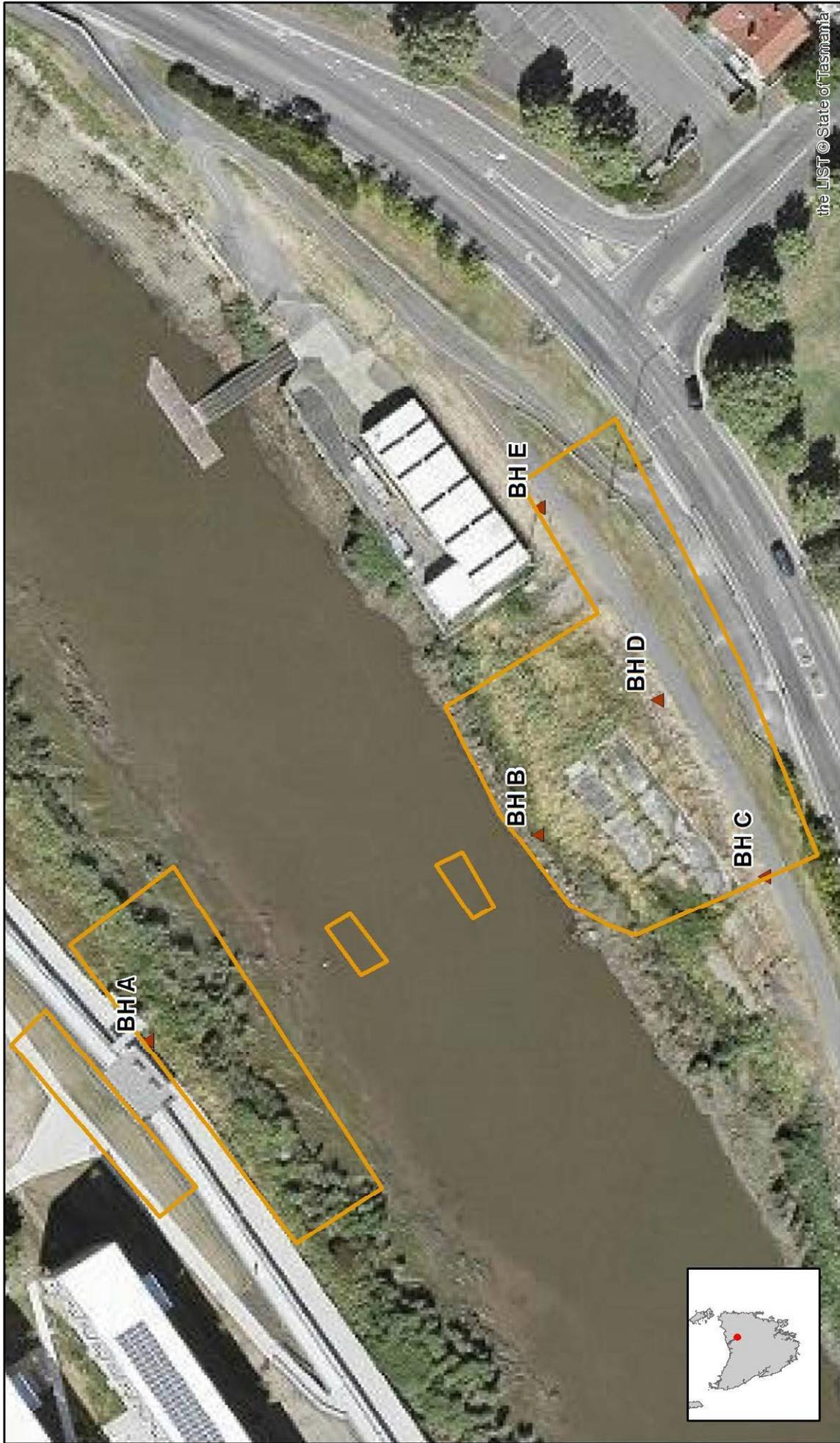
- Proposed bridge design disturbance
- Land Parcels (title reference)

N

0 15 30 60 Meters

Coordinate System: GDA1994 MGA Zone 55
1:2,636 When Printed at A4

MAP REF	LN18249R3	DATA	Base map from The LIST
REVISION	B	SOURCES	Base data from The LIST
AUTHOR	Klawrence		Tasmanian Government
DATE	28/06/2019		



the LIST © State of Tasmania

UTAS

**Inveresk Pedestrian Cycle Bridge
Sampling Locations**

pitt&sherry

Legend

- Proposed bridge design disturbance
- ▲ Borehole/soil samples



Coordinate System: GDA1994 MGA Zone 55
1:843 When Printed at A4

MAP REF	LN18249 R2	DATA	Base map from The LIST
REVISION	B	SOURCES	Base data from The LIST
AUTHOR	Klawrence		Tasmanian Government
DATE	25/06/2019		

Historical Aerial Photographs

Appendix B

Aerial Photographs

14/11/1973 Scale 1:15,500



26/02/1992 Scale 1:12,500



08/03/2009 Scale 1:7,000



2018 – The List State Aerial Photograph



Property Title Information

Appendix C

Level 7, 134 Macquarie Street, Hobart TAS
GPO Box 1550, Hobart, TAS 7001 Australia

Enquiries: Contaminated Sites Unit
Phone: (03) 6165 4599
Email: contaminatedsites@epa.tas.gov.au
Web: www.epa.tas.gov.au
Our Ref: (EN-EM-AV-100706_38: H966289) sma
Your Ref: PLNH00047



5 November 2018

Ms Katie Lawrence
Pitt and Sherry
Level 1 Surrey House
199 Macquarie Street
HOBART TAS 7000

Dear Ms Lawrence

**PROPERTY INFORMATION REQUEST
2 Invermay Road, Invermay
PID 3389971**

On 13 September 2018, the Contaminated Sites Unit received your Property Information Request relating to the land referred to above ('the Site'). A search of relevant databases and records has been undertaken.

The Site historically hosted the Launceston railyards and workshops, Pioneer Concrete works and sporting grounds. It now hosts the Launceston Showgrounds, Queen Victoria Museum and the University of Tasmania Inveresk Campus.

EPA Tasmanian has numerous volumes of documents regarding the redevelopment and repurposing of the Site during the 1990s. These include, but are not limited to:

- *Environmental Audit - Inveresk Railway Workshops Redevelopment project Launceston Tasmania for Launceston City Council Volume 1: Site History*, dated February 1992, prepared by Dames and Moore
- *Queen Victoria Museum and Art Gallery - Inveresk Railyard Redevelopment - Contamination Assessment Report - Land*, dated June 1999, prepared by SEMF
- *Queen Victoria Museum and Art Gallery - Inveresk Railyard Redevelopment - Contamination Assessment Report - Buildings*, dated June 1999, prepared by SEMF
- *Launceston City Council August 1999 York Park Environmental Site assessment*, prepared by SKM
- *Department of State Development - Inveresk Railyard Redevelopment Project - Site Management Plan*, dated August 2000, prepared by SEMF

There are also records relating to neighbouring properties:

129-139 Invermay Road

- Historic WorkSafe Tasmania (WST) records indicate that dangerous goods were stored in underground storage tanks (USTs) at the property between 1949 and 1960. The record refers to WST file number N27.
- EPA Tasmania received notification in September 1999 of an incident at the Mobil Service Station having the potential to cause harm. Approval to remove the contaminated soil to Remount Road was given in 2000.

- Currently the property hosts a United Petroleum Service Station with four active UPSS with a total volume of 85,000L.

103 Invermay Road

- Six UPSS were registered at the Coles Express Service station in September 2010. EPA Tasmania received advice that three Underground Storage Tanks were removed and another decommissioned in situ at the property in November 2011 due to leaking.
- Remediation Notice 8655/1 (RN) was issued in July 2013 to require further works to address petroleum hydrocarbon contamination in groundwater and vapour risk concerns. The RN was revoked in November 2014.
- EPA Tasmania hold several documents regarding this property. The most recent is:

Environmental Site Assessment - Coles Express Invermay Service Station - 103 Invermay Road Invermay, dated 31 March 2014, prepared by ERM

3-11 Dry Street

- Three UPSS were registered at the Caltas Petrol Station in June 2010.
- A decommissioning form stated that two UPSS were removed in December 2015

32-38 Invermay Road

- Four UPSS with a total volume of 89,000L are registered at the Caltas service station.

1-19 Lindsay Street (Scottsdale Levee)

- Site Management Notice 8655/1, relating to the burial of approximately 300 m³ of hydrocarbon contaminated Soil, is registered on the property.
- EPA Tasmania holds the following report regarding the contaminated soil:

Summary Report - Burial of PAH Contaminated Soil Scottsdale Levee, dated October 2011, prepared by Pitt and Sherry

No other records relating to contamination or potentially contaminating activities at the Site or adjacent properties were found.

The search of records is restricted to those held by EPA Tasmania and includes records relating to: The *Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2010*; Industrial Sites (which are or have been regulated by EPA Tasmania); historical landfills; and contamination issues reported to the Contaminated Sites Unit. In addition, the Incidents and Complaints database and records relating to the historical storage of dangerous goods (as detailed below) are searched.

WorkSafe Tasmania (1300 366 322 or wstinfo@justice.tas.gov.au) may have issued dangerous goods licences and/or may hold relevant records for the Site and adjoining properties. As the storage of dangerous goods/fuels is an environmentally relevant activity, you may wish to contact them for further information.

Please note that the dangerous goods licensing records referred to by EPA Tasmania are for sites with underground storage tanks that ceased holding Dangerous Goods Licences prior to 1993. WorkSafe Tasmania hold the records for these Licences after 1993.

EPA Tasmania does not hold records on all sites that are or may be contaminated. You should consider obtaining a site history to determine the likelihood of contamination. If contamination on the Site or an adjacent property is considered likely, further assessment by a competent environmental assessment practitioner is recommended. Site assessments should be conducted in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999*, National Environment Protection Council (or as varied). <http://epa.tas.gov.au/regulation/contaminated-sites/identification-and-assessment-of-contaminated-land/contaminated-site-assessment>

Please note since 1 July 2015, the Director has required all environmental site assessments and reports submitted to the Contaminated Sites Unit for consideration to be prepared by a person certified as a specialist contaminated sites consultant under a scheme approved by the Director. Effective 30 June 2018, the endorsed scheme is operated by Certified Environmental Practitioners (CEnvP): Consultants certified under this scheme are approved to use the seal **CEnvP Site Contamination**. <https://www.cenvp.org>.

Further details are available at: <http://epa.tas.gov.au/regulation/contaminated-sites/identification-and-assessment-of-contaminated-land/engaging-a-contaminated-site-assessment-consultant>.

As local councils are able to issue Environment Protection Notices, Environmental Infringement Notices and record complaints, you may wish to contact them for additional information that may be relevant to the site. Further, if the Site has historically been subject to a permit under the *Land Use Planning and Approvals Act 1993*, the Council would have issued the permit.

Under the *Right to Information Act 2009* (RTI Act), you are entitled to apply for any records mentioned within this letter such as reports, letters, or other relevant documents. For further information on how the RTI process works and how to request information under the RTI Act please visit the Department of Primary Industries, Parks, Water and Environment website.

If you are purchasing a property, you should consider Part 5A of the *Environmental Management and Pollution Control Act 1994* (EMPCA) which defines and specifies requirements for managing contaminated sites. If there is reason to believe the site is, or is likely to be, contaminated there are certain requirements that you must meet (e.g. notification of a likely contaminated site to the Director, EPA as outlined in section 74B of the EMPCA).

Although all due care has been taken in the preparation of this letter, the Crown gives no warranty, express or implied, as to the accuracy or completeness of the information provided. The Crown and its servants or agents accept no responsibility for any loss or damage arising from reliance upon this letter, and any person relying on the letter does so at their own risk absolutely.

As you are aware, property searches incur a charge of \$237.00. An invoice is enclosed.

If you have any queries in relation to the matters above, please contact the Contaminated Sites Unit using the details at the head of this correspondence or refer to the EPA website at www.epa.tas.gov.au and click on 'Regulation' to locate information on Underground Fuel Tanks and Contaminated Sites.

Yours sincerely



Bruce Napier
ENVIRONMENTAL OFFICER - CONTAMINATED SITES

Email: sleroux@pittsh.com.au
klawrence@pittsh.com.au

Attachment: Invoice

Level 7, 134 Macquarie Street, Hobart TAS
GPO Box 1550, Hobart, TAS 7001 Australia

Enquiries: Contaminated Sites Unit
Phone: (03) 6165 4599
Email: contaminatedsites@epa.tas.gov.au
Web: www.epa.tas.gov.au
Our Ref: (EN-EM-AV-100706_38: H966323) sma



5 November 2018

Ms Katie Lawrence
Pitt and Sherry
Level 1, Surrey House
199 Macquarie Street
HOBART TAS 7000

Dear Ms Lawrence

**PROPERTY INFORMATION REQUEST
86 Cimitiere Street, Launceston and associated land
Certificate of Title: 144356/1, 144355/1 and 31568/2**

On 13 September 2018, the Contaminated Sites Unit received your Property Information Request relating to the land referred to above (the Site). A search of relevant databases and records has been undertaken.

The Site is in a former light industrial area of Launceston and is adjacent to the former Launceston Gasworks site and service stations.

EPA Tasmania received a number of environmental assessment reports on the Site prepared by SEMF as part of a development application seeking site sign off from the Director of Environmental Management (the Director); including:

- *Woolworths Development, Willis Street, Launceston - Groundwater Investigation Report, dated November 2006, by SEMF Pty Ltd (SEMF) ('the groundwater report');*
- *Woolworths Development, Willis Street, Launceston - Health Risk Assessment, dated December 2006, by SEMF ('the HRA');* and
- *Woolworths Development, Willis Street, Launceston - Site Management Plan, dated December 2006, by SEMF ('the SMP').*

In a letter dated 21 December 2006 the Director provided comments regarding the submitted reports (See Attachment 1) and advised that Site sign off would not be granted until a signed agreement between the Launceston City Council and the landowner was received.

No further records or requests for sign-off for the Site were found, however records regarding neighbouring properties were located.

To the west of the Site is the former Launceston Gasworks site, which was located on Willis Street, between Boland Street and Cimitiere Street. EPA Tasmania has nine volumes of reports relating to coal gas production at the site, which ceased in 1996, and the subsequent decommissioning and rehabilitation of the site (1999-2007).

¹Australian and New Zealand Environment and Conservation Council 2000

Environmental Protection Notice (EPN) 696/1 was issued in September 2003 to regulate the environmental works relating to soil contamination and groundwater monitoring. The chemicals of concern were PAH's, BETX, TPH, phenols, ammonia and cyanide arising from tar and other liquid wastes. Please note that EPN 696/1 included **12 Boland Street** (CT 123976/2) which adjoins the Site.

The report; "*Former Launceston Gasworks – Groundwater Monitoring Investigations, September 2006*" prepared by Earth Tech Engineering Pty Ltd and dated November 2006 was received on 28 November 2006 and included a request to cease groundwater monitoring.

The Director concurred with the request in a letter dated 11 Jan 2007 (see Attachment 2) and the EPN was withdrawn.

68-76 Cimitiere Street hosted the *Shell City Park Service Station* that ceased trading in January 1996. All infrastructure was removed and environmental site assessments were conducted between 1996 to 1999.

EPA Tasmania holds several reports relating to this site including:

Former Shell Launceston City Park Service Station Site Validation Report. 68-76 Cimitiere Street Launceston Tasmania dated September 1999, prepared by IT Environmental Aust. Pty Ltd

In a letter, dated 17 Jan 2000, to Launceston City Council regarding Development Application DA 566/99 the Acting Director advised the following:

"The future use of the site is as a vehicle tinting service and carpark. As notification of environmental harm (under Section 33 of the Environmental Management and Pollution Control Act 1994 [EMPCA] has not been received for this site and it is not being redeveloped for a more sensitive use"

"On review of these reports I am satisfied that there is no evidence of environmental harm (as defined in EMPCA1994) occurring on or off the site."

EPA Tasmania received a decommissioning form for the removal of an underground petroleum storage system at **4-6 Boland Street** in March 2018. No ongoing contamination concerns were raised

Historic WorkSafe Tasmania (WST) record indicates that between 1947 and 1956 dangerous goods were stored in underground storage tanks (UST) at neighbouring properties **13 Tamar Street** and **15-21 Tamar Street**. The record refers to file number L163.

In August 2018, EPA Tasmania approved a request for the City of Launceston to dispose of 4,972 tonnes of low-level contaminated soil excavated during streetscape works in Cimitiere Street. Level 2 total petroleum hydrocarbons and leachable PAH including Benzo(a)pyrene.

No further records relating to contamination or potentially contaminating activities at the Site or adjacent properties were found.

The search of records is restricted to those held by EPA Tasmania and includes records relating to: The *Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2010*, industrial Sites (which are or have been regulated by EPA Tasmania), historical landfills and contamination issues reported to the Contaminated Sites Unit. In addition, the Incidents and Complaints database and records relating to the historical storage of dangerous goods (as detailed below) are searched.

WorkSafe Tasmania (1300 366 322 or wstinfo@justice.tas.gov.au) may have issued dangerous goods licences and/or may hold relevant records for the Site and adjoining properties. As the storage of dangerous goods/fuels is an environmentally relevant activity, you may wish to contact them for further information.

Please note that the dangerous goods licensing records referred to by EPA Tasmania are for sites with underground storage tanks that ceased holding Dangerous Goods Licences prior to 1993. WorkSafe Tasmania hold the records for these Licences after 1993.

EPA Tasmania does not hold records on all sites that are or may be contaminated. You should consider obtaining a site history to determine the likelihood of contamination. If contamination on the Site or an adjacent property is considered likely, further assessment by a competent environmental assessment practitioner is recommended. Site assessments should be conducted in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999*, National Environment Protection Council (or as varied). <http://epa.tas.gov.au/regulation/contaminated-sites/identification-and-assessment-of-contaminated-land/contaminated-site-assessment>

Please note since 1 July 2015, the Director has required all environmental site assessments and reports submitted to the Contaminated Sites Unit for consideration to be prepared by a person certified as a specialist contaminated sites consultant under a scheme approved by the Director. Effective 30 June 2018, the endorsed scheme is operated by Certified Environmental Practitioners (CEnvP): Consultants certified under this scheme are approved to use the seal **CEnvP Site Contamination**. <https://www.cenvp.org>.

Further details are available at: <http://epa.tas.gov.au/regulation/contaminated-sites/identification-and-assessment-of-contaminated-land/engaging-a-contaminated-site-assessment-consultant>.

As local councils are able to issue Environment Protection Notices, Environmental Infringement Notices and record complaints, you may wish to contact them for additional information that may be relevant to the site. Further, if the Site has historically been subject to a permit under the *Land Use Planning and Approvals Act 1993*, the Council would have issued the permit.

Under the *Right to Information Act 2009* (RTI Act), you are entitled to apply for any records mentioned within this letter such as reports, letters, or other relevant documents. For further information on how the RTI process works and how to request information under the RTI Act please visit the Department of Primary Industries, Parks, Water and Environment website.

If you are purchasing a property, you should consider Part 5A of the *Environmental Management and Pollution Control Act 1994* (EMPCA) which defines and specifies requirements for managing contaminated sites. If there is reason to believe the site is, or is likely to be, contaminated there are certain requirements that you must meet (e.g. notification of a likely contaminated site to the Director, EPA as outlined in section 74B of the EMPCA).

Although all due care has been taken in the preparation of this letter, the Crown gives no warranty, express or implied, as to the accuracy or completeness of the information provided. The Crown and its servants or agents accept no responsibility for any loss or damage arising from reliance upon this letter, and any person relying on the letter does so at their own risk absolutely.

As you are aware, property searches incur a charge of \$237.00. An invoice is enclosed.

If you have any queries in relation to the matters above, please contact the Contaminated Sites Unit using the details at the head of this correspondence or refer to the EPA website at www.epa.tas.gov.au and click on 'Regulation' to locate information on Underground Fuel Tanks and Contaminated Sites.

Yours sincerely



Bruce Napier
ENVIRONMENTAL OFFICER - CONTAMINATED SITES

Email: sleroux@pittsh.com.au
klawrence@pittsh.com.au

Attachment: Invoice
Attachment 1
Attachment 2

DEPARTMENT of
TOURISM, ARTS and the ENVIRONMENT

ENVIRONMENT DIVISION

Enquiries: Jeff Miller
Phone: 6233 2782
Email: jeffrey.miller@environment.tas.gov.au
Our Ref: 109299:(EWM\Contam\willis street_launceston09_let) tm

9 December
21 November 2006

Mr Jeff Reynolds
Tasmania Manager
MCD Australia Pty Ltd
Level 3, 85 Macquarie Street
HOBART TAS 7000

FAXED

Facsimile: (03) 6234 9799

Dear Mr Reynolds

Woolworths Development, Willis Street, Launceston, Tasmania

The Environment Division received the following documents in reference to the proposed Woolworths Development located along Willis Street, Launceston, Tasmania ('the site'):

- *Woolworths Development, Willis Street, Launceston - Groundwater Investigation Report*, dated November 2006, by SEMF Pty Ltd (SEMF) ('the groundwater report');
- *Woolworths Development, Willis Street, Launceston - Health Risk Assessment*, dated December 2006, by SEMF ('the HRA');
- *Woolworths Development, Willis Street, Launceston - Site Management Plan*, dated December 2006, by SEMF ('the SMP');
- A draft 'Part 5 Agreement' under the Land Use Planning and Approvals Act 1993 dated 15 December 2006, by Mallesons Stephen Jaques ('the draft Agreement').

It is understood that the above documents have been submitted to this Division for site sign-off for the redevelopment of the site. These documents have been reviewed and comments are provided below.

The groundwater report details an additional groundwater investigation conducted in the southern and south eastern areas of the site. This additional investigation was needed to ensure that contaminated groundwater has not migrated on to the site from off-site locations. It is noted that, as with the initial investigation, groundwater at the site contains manganese concentrations and pH values outside Australian Drinking Water Quality Guidelines, as well as concentrations of ammonia and iron above the ANZECC 2000¹ Water Quality Guidelines for recreational purposes. Based on the results above, it was recommended that groundwater use on the site is to be controlled to ensure that no groundwater is extracted or used for any purpose.

¹ Australian and New Zealand Environment and Conservation Council 2000

The HRA details the results of a site-specific health risk assessment performed on the site. The report was prepared to ensure that any risks to site occupiers were adequately identified and controlled. The SMP presents a summary of environmental risk management practices to be implemented during and after the construction at the site to address risks presented by the contamination identified at the site.

It is noted that the HRA was completed in accordance with Australian Standard 4360 (AS4360), and not Schedule B (4) of the NEPM² as requested in correspondence from this Division dated 2 November 2006. While the risk assessment model outlined in AS4360 is not generally accepted by the Contaminated Sites Unit for use in assessing risk at contaminated sites, this Division concurs that the level of risk identified in the HRA is able to be satisfactorily controlled through the implementation of the environmental risk management measures outlined in the SMP.

It is understood that an Agreement, to be entered into between Sandhurst Trustees Limited (the owner) and Launceston City Council (Council) under the Tasmanian Land Use Planning and Approvals Act 1993, will formalise the recommendations outlined in the SMP. I have reviewed the draft Agreement and I am satisfied the specific environmental management sections (specifically Recital C, and Clauses 3 and 4) adequately describe the environmental risk management measures necessary for the proposed future use of the site.

Please note that this letter does not constitute a sign-off for the site. Sign-off will only be granted when this Division receives confirmation that the Agreement has been finalised and signed by both the owner and Council. Further, sign-off will only be granted on the basis that site management will not vary from that specifically described within the final SMP dated 13 December 2006 and the proposed land use as shown in Appendix B of the report *Woolworths Development, Willis Street, Launceston, Site History*, dated 21 September 2006 by SEMF.

I look forward to receiving confirmation that the Agreement has been finalised. Once this has occurred, the Environment Division will be in a position to provide you with a site sign-off letter.

As you are aware there is a charge for report review. The review of the above documents involved eight hours of officer time at an hourly rate of \$99.82 (excluding GST). An invoice will be sent to you separately.

If you require any further information regarding this matter, please contact Jeff Miller on (03) 6233 2782.

Yours sincerely



Mr Floyd Browne
DIRECTOR OF ENVIRONMENTAL MANAGEMENT

- cc: Ms Carly Harington, Environmental and Safety Scientist, SEMF Pty Ltd, 45 Murray Street, HOBART TAS 7000
- cc: Planning Officer, Launceston City Council, PO Box 396, LAUNCESTON TAS 7250



² National Environment Protection Measure for the Assessment of Site Contamination 1999

DEPARTMENT of
TOURISM, ARTS *and the* ENVIRONMENT

ENVIRONMENT DIVISION

Enquiries: Jeff Miller
Phone: (03) 6233 2782
Email: Jeffrey.Miller@environment.tas.gov.au
Our Ref: 030662: (M:\ENV\EE0\EWM\Sh\CONTAM\gascorp48_let) tm

11 January 2007

Ms Ada Cinaglia
Asset Management Services
Origin Energy
1 Wood Street
THOMASTOWN VIC 3074

Facsimile: (03) 9463 8219

FAXED
11 Jan 07
of invoice to Carol

Dear Ms Cinaglia

**Former Launceston Gasworks Remediation Project: Application to Cease
Groundwater Monitoring**

The Environment Division received a report by Earth Tech Engineering Pty Ltd entitled *Former Launceston Gasworks – Groundwater Monitoring Investigation, September 2006*, dated November 2006 ('the report'). The report details the results of the latest groundwater monitoring investigation (GMI) as required by Environment Protection Notice (EPN) 696/1 and contains a request that the requirement for ongoing groundwater monitoring be lifted.

In the report, results from the current GMI are compared to previous groundwater monitoring events undertaken both before and after the completion of site remedial works in March 2005. Additionally, analytical results for geochemical parameters are presented to identify the potential for natural attenuation of the remaining dissolved phase groundwater contamination at the site.

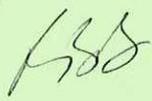
The results of this most recent GMI show a continuing trend of generally decreasing concentrations for a majority of target contaminants in selected monitoring wells at the site. Additionally, historically clean wells have remained so since the completion of remedial works. Finally, the results from the geochemical analysis are indicative of the conditions required for natural attenuation.

Given the above, I am pleased to inform you that the Environment Division accepts your application to cease further groundwater monitoring and is now satisfied that all conditions of EPN 696/1 have been complied with in full. Please find attached an Environmental Protection Notice Compliance Certificate for your records. Also, please note that a Certificate of Cancellation for the EPN will be sent to the Tasmanian Land Titles Office which will result in the subsequent removal of the EPN from the Land Title.

As you are aware there is a charge for report review. The review of the above report involved three hours of officer time at an hourly rate of \$90.75 (excluding GST). An invoice will be sent to you separately.

The Environment Division thanks you and your consultant for your professional and diligent management of this site. If you require any further information regarding this matter, please contact Jeff Miller on (03) 6233 2782.

Yours sincerely



Floyd Browne
DIRECTOR OF ENVIRONMENTAL MANAGEMENT

- cc: Adele Gliddon, Senior Environmental Health Officer, Launceston City Council, PO Box 396, LAUNCESTON TAS 7250
- cc: Paul Carstairs, Project Manager, Earth Tech Engineering Pty Ltd, 71 Queens Road, MELBOURNE VIC 3004



Attachment 1

Environment Protection Notice Compliance Certificate



Tasmania

Department of Tourism, Arts and the Environment

ENVIRONMENT PROTECTION NOTICE COMPLIANCE CERTIFICATE

Issued under the Environmental Management and Pollution Control Act 1994

Environment Protection
Notice Number:

696/1

Date of Issue:

16 September 2003

Issued to:

Origin Energy Tasmania Ltd ACN 009 539 753 situated at
Level 6, 1 King William Street, Adelaide SA 5000

Activity:

Removal of tar and remediation of soil and groundwater
contamination at the former Launceston Gas Works, 8-10
Boland Street, Launceston, Tasmania 7250 (Land Title
Volume 250467 Folio 3, Volume 250467 Folio 1, Volume
236232 Folio 1, Volume 123976 Folio 2).

I, Floyd Browne, Director of Environmental Management, am satisfied, on the evidence available to me, that the person to whom the above Environment Protection Notice was issued has complied with the requirements thereof.

The Crown does not indemnify the person to whom this certificate is issued for any damages that may be suffered by any person or the environment, arising from the activity in relation to which the Environment Protection Notice was issued.

A handwritten signature in black ink, appearing to read 'F. Browne'.

Director of Environmental Management:

Date of Issue:

Site Inspection Photographs

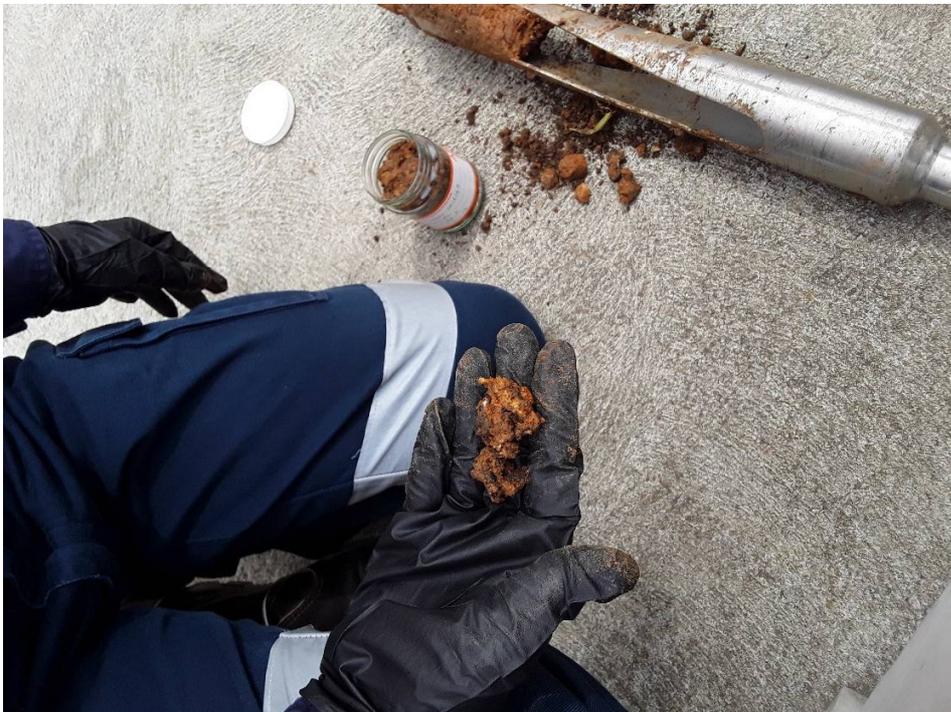
Appendix D

Site Photographs

Photo showing the extent of vegetation on the river bank inside the floodwall



Soil composition of BH_A



Soil composition inside flood wall (BH_B)



Soil composition adjacent to walkway (BH_C)



Laboratory Certificate of Analysis

Appendix E



Environmental

CERTIFICATE OF ANALYSIS

Work Order : : 1 of 7

Client : **Pitt & Sherry (Operations) Pty Ltd**

Contact : SOPHIE LE ROUX

Address : PO BOX 94 199 MACQUARIE ST
HOBART TAS, AUSTRALIA 7001

Telephone :

Project :

Order number :

C-O-C number :

Sampler :

Site :

Quote number : EN/222

No. of samples received :

No. of samples analysed :



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. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical 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
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	



Page : 2 of
 Work Order : EM1818185
 Client :
 Project :

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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 Contact 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
- ∅ = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) 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.



Automated Guideline Comparison Report

EPA Tasmania Information Bulletin No. 105 - Table 2: Soil Hazard Categorisation

Work Order	:	Page	:	1 of
Client	:	Laboratory	:	Environmental Division Melbourne
Contact	:	Address	:	
Address	:	E-mail	:	
	:	Telephone	:	
	:	Facsimile	:	
	:	Date Received	:	
	:	Date Analysed	:	
	:	Date Issued	:	16-Nov-2018 16:03
	:	Quote number	:	

General Comments

This guideline comparison report **only** provides evaluation of total concentration data against upper limit thresholds for the 'Fill Material', 'Low Level Contaminated Soil', and 'Contaminated Soil' categories in Table 2 of EPA Tasmania Information Bulletin No. 105.

This guideline comparison report is **NOT** a soil classification report. Classification of soils requires consideration of a number of other factors including preliminary site investigation, sampling density and statistical calculations.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

This guideline comparison report only provides evaluation data where chemical parameters specifically listed within Table 2 of EPA Tasmania Information Bulletin No. 105 are analysed by ALS using the **P-20/1 package in full**. P-20/1 package does not include Tributyltin.

Red shading is applied where the result is equal to or greater than the guideline upper limit and/or equal to or lower than the guideline lower limit. Red shading is not applied to the 'Summary of Thresholds Reached or Exceeded'.

For the 'Summary of Thresholds Reached or Exceeded' to accurately function, all samples must be analysed and included in the 'Analytical Results' section of the following report. Please verify that all required IDs are listed and analysed.

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.



Work Order : EM1818185
 Client : Pitt & Sherry (Operations) Pty Ltd
 Project :

Summary of Thresholds Reached or Exceeded

TAS EPA Bulletin No. 105 (2012)

Table 2: Maximum Total Concentration: Contaminated Soil - Level 3

Client Sample ID	ALS Sample ID	Compound	Method	LOR	Limits	Result
BH - E	EM1818185-005	Lead	EG005T	5	< 3,000 mg/kg	3000 mg/kg

TAS EPA Bulletin No. 105 (2012)

Table 2: Maximum Total Concentration: Fill Material - Level 1

Client Sample ID	ALS Sample ID	Compound	Method	LOR	Limits	Result
BH - A	EM1818185-001	Chromium	EG005T	2	< 50 mg/kg	97 mg/kg
BH - B	EM1818185-002	Zinc	EG005T	5	< 200 mg/kg	200 mg/kg
BH - B	EM1818185-002	Benzo(a)pyrene	EP075-TAS	0.05	< 0.08 mg/kg	0.28 mg/kg
BH - C	EM1818185-003	Manganese	EG005T	5	< 500 mg/kg	537 mg/kg
BH - C	EM1818185-003	Nickel	EG005T	2	< 60 mg/kg	119 mg/kg
BH - D	EM1818185-004	Nickel	EG005T	2	< 60 mg/kg	62 mg/kg
BH - E	EM1818185-005	Lead	EG005T	5	< 300 mg/kg	3000 mg/kg
BH - E	EM1818185-005	Manganese	EG005T	5	< 500 mg/kg	593 mg/kg
BH - E	EM1818185-005	Benzo(a)pyrene	EP075-TAS	0.05	< 0.08 mg/kg	2.88 mg/kg

TAS EPA Bulletin No. 105 (2012)

Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Client Sample ID	ALS Sample ID	Compound	Method	LOR	Limits	Result
BH - E	EM1818185-005	Lead	EG005T	5	< 1,200 mg/kg	3000 mg/kg
BH - E	EM1818185-005	Benzo(a)pyrene	EP075-TAS	0.05	< 2 mg/kg	2.88 mg/kg



Work Order : EM1818185
 Client : Pitt & Sherry (Operations) Pty Ltd
 Project :

Analytical Results

Classification and Management of Contaminated Soil for Disposal

Table 2 Maximum total conc. - Contaminated Soil: Table 2: Maximum Total Concentration: Contaminated Soil - Level 3

Compound	Method	LOR	Unit	Guideline		Client sample ID				
				Lower Limit	Upper Limit	BH - A	BH - B	BH - C	BH - D	BH - E
						12-Nov-2018 11:40 EM1818185-001	12-Nov-2018 12:30 EM1818185-002	12-Nov-2018 12:45 EM1818185-003	12-Nov-2018 13:00 EM1818185-004	12-Nov-2018 13:15 EM1818185-005
EG005T: Total Metals by ICP-AES										
Arsenic	EG005T	5	ng/kg	----	750	12	12	<5	<5	10
Barium	EG005T	10	ng/kg	----	30000	20	90	20	40	120
Beryllium	EG005T	1	ng/kg	----	400	<1	<1	<1	<1	<1
Cadmium	EG005T	1	ng/kg	----	400	<1	<1	<1	<1	<1
Chromium	EG005T	2	ng/kg	----	5000	97	34	20	24	44
Cobalt	EG005T	2	ng/kg	----	1000	<2	12	26	16	15
Copper	EG005T	5	ng/kg	----	7500	9	39	38	21	60
Lead	EG005T	5	ng/kg	----	3000	28	200	<5	7	3000
Manganese	EG005T	5	ng/kg	----	25000	36	454	537	437	593
Molybdenum	EG005T	2	ng/kg	----	4000	<2	<2	<2	<2	4
Nickel	EG005T	2	ng/kg	----	3000	8	19	119	62	35
Selenium	EG005T	5	ng/kg	----	200	<5	<5	<5	<5	<5
Silver	EG005T	2	ng/kg	----	720	<2	<2	<2	<2	<2
Tin	EG005T	5	ng/kg	----	900	<5	11	<5	<5	25
Zinc	EG005T	5	ng/kg	----	50000	37	200	48	38	156
EG035T: Total Recoverable Mercury by FIMS										
Mercury	EG035T	0.1	ng/kg	----	110	<0.1	0.2	<0.1	<0.1	0.4
EG048: Hexavalent Chromium (Alkaline Digest)										
Hexavalent Chromium	EG048G	0.5	ng/kg	----	2000	<0.5	<0.5	<0.5	<0.5	<0.5
EK026SF: Total CN by Segmented Flow Analyser										
Total Cyanide	EK026SF	1	ng/kg	----	2500	<1	<1	<1	<1	4
EK040T: Fluoride Total										
Fluoride	EK040T	40	ng/kg	----	10000	100	150	150	70	100
EP066: Polychlorinated Biphenyls (PCB)										
Total Polychlorinated biphenyls	EP066	0.1	ng/kg	----	50	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)										
Sum of Aldrin + Dieldrin	EP068	0.05	ng/kg	----	50	<0.05	<0.05	<0.05	<0.05	<0.05
Sum of DDD + DDE + DDT	EP068	0.05	ng/kg	----	1000	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds										
Sum of Phenols	EP075(SIM)	0.5	ng/kg	----	2000	<0.5	<0.5	<0.5	<0.5	<0.5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons										
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	ng/kg	----	200	<0.5	<0.5	<0.5	<0.5	19.3



: EM1818185
 : Pitt & Sherry (Operations) Pty Ltd
 :

Work Order
 Client
 Project

Classification and Management of Contaminated Soil for Disposal

Table 2 Maximum total conc. - Contaminated Soil: Table 2: Maximum Total Concentration: Contaminated Soil - Level 3

Compound	Method	LOR	Unit	Guideline		Client sample ID							
				Lower Limit	Upper Limit	BH - A		BH - B		BH - C		BH - D	
				Guideline	Guideline	12-Nov-2018 11:40	EM1818185-001	12-Nov-2018 12:30	EM1818185-002	12-Nov-2018 12:45	EM1818185-003	12-Nov-2018 13:00	EM1818185-004
Sub-Matrix: SOIL													
EP075B: Polynuclear Aromatic Hydrocarbons													
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	20	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	2.88	
EP080/071: Total Petroleum Hydrocarbons													
C6 - C9 Fraction	EP080	10	mg/kg	----	1000	<10	<10	<10	<10	<10	<10	<10	
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	10000	<50	<50	<50	<50	<50	<50	260	
EP080: BTEXN													
Benzene	EP080	0.2	mg/kg	----	50	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	EP080	0.5	mg/kg	----	1000	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	EP080	0.5	mg/kg	----	1080	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Total Xylenes	EP080	0.5	mg/kg	----	1800	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	



Work Order : EM1818185
 Client : Pitt & Sherry (Operations) Pty Ltd
 Project :

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Fill Material: Table 2: Maximum Total Concentration: Fill Material - Level 1
 Sub-Matrix: SOIL

Compound	Method	LOR	Unit	Guideline		BH - A 12-Nov-2018 11:40 EM1818185-001	BH - B 12-Nov-2018 12:30 EM1818185-002	BH - C 12-Nov-2018 12:45 EM1818185-003	BH - D 12-Nov-2018 13:00 EM1818185-004	BH - E 12-Nov-2018 13:15 EM1818185-005
				Lower Limit	Upper Limit					
EG005T: Total Metals by ICP-AES										
Arsenic	EG005T	5	ng/kg	----	20	12	12	<5	<5	10
Barium	EG005T	10	ng/kg	----	300	20	90	20	40	120
Beryllium	EG005T	1	ng/kg	----	2	<1	<1	<1	<1	<1
Cadmium	EG005T	1	ng/kg	----	3	<1	<1	<1	<1	<1
Chromium	EG005T	2	ng/kg	----	50	97	34	20	24	44
Cobalt	EG005T	2	ng/kg	----	100	<2	12	26	16	15
Copper	EG005T	5	ng/kg	----	100	9	39	38	21	60
Lead	EG005T	5	ng/kg	----	300	28	200	<5	7	3000
Manganese	EG005T	5	ng/kg	----	500	36	454	537	437	593
Molybdenum	EG005T	2	ng/kg	----	10	<2	<2	<2	<2	4
Nickel	EG005T	2	ng/kg	----	60	8	19	119	62	35
Selenium	EG005T	5	ng/kg	----	10	<5	<5	<5	<5	<5
Silver	EG005T	2	ng/kg	----	10	<2	<2	<2	<2	<2
Tin	EG005T	5	ng/kg	----	50	<5	11	<5	<5	25
Zinc	EG005T	5	ng/kg	----	200	37	200	48	38	156
EG035T: Total Recoverable Mercury by FIMS										
Mercury	EG035T	0.1	ng/kg	----	1	<0.1	0.2	<0.1	<0.1	0.4
EG048: Hexavalent Chromium (Alkaline Digest)										
Hexavalent Chromium	EG048G	0.5	ng/kg	----	1	<0.5	<0.5	<0.5	<0.5	<0.5
EK026SF: Total CN by Segmented Flow Analyser										
Total Cyanide	EK026SF	1	ng/kg	----	32	<1	<1	<1	<1	4
EK040T: Fluoride Total										
Fluoride	EK040T	40	ng/kg	----	300	100	150	150	70	100
EP066: Polychlorinated Biphenyls (PCB)										
Total Polychlorinated biphenyls	EP066	0.1	ng/kg	----	2	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)										
Sum of Aldrin + Dieldrin	EP068	0.05	ng/kg	----	2	<0.05	<0.05	<0.05	<0.05	<0.05
Sum of DDD + DDE + DDT	EP068	0.05	ng/kg	----	2	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds										
Sum of Phenols	EP075(SIM)	0.5	ng/kg	----	25	<0.5	<0.5	<0.5	<0.5	<0.5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons										
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	ng/kg	----	20	<0.5	<0.5	<0.5	<0.5	19.3
EP075B: Polynuclear Aromatic Hydrocarbons										



Work Order : EM1818185
 Client : Pitt & Sherry (Operations) Pty Ltd
 Project :

Classification and Management of Contaminated Soil for Disposal

Table 2 Maximum total conc. - Fill Material: Table 2: Maximum Total Concentration: Fill Material - Level 1

Compound	Method	LOR	Unit	Guideline		Client sample ID							
				Lower Limit	Upper Limit	BH - A		BH - B		BH - C		BH - D	
						12-Nov-2018 11:40	EM1818185-001	12-Nov-2018 12:30	EM1818185-002	12-Nov-2018 12:45	EM1818185-003	12-Nov-2018 13:00	EM1818185-004
EP075B: Polynuclear Aromatic Hydrocarbons - Continued													
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	0.08	<0.05	0.28	<0.05	<0.05	<0.05	<0.05	2.88	
EP080/071: Total Petroleum Hydrocarbons													
C6 - C9 Fraction	EP080	10	mg/kg	----	65	<10	<10	<10	<10	<10	<10	<10	
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	1000	<50	<50	<50	<50	<50	<50	260	
EP080: BTEXN													
Benzene	EP080	0.2	mg/kg	----	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	EP080	0.5	mg/kg	----	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	EP080	0.5	mg/kg	----	3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Total Xylenes	EP080	0.5	mg/kg	----	14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	



Work Order : EM1818185
 Client : Pitt & Sherry (Operations) Pty Ltd
 Project :

Classification and Management of Contaminated Soil for Disposal

Table 2 Maximum total conc. - Low Level Contaminated Soil: Table 2. Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Compound	Method	LOR	Unit	Client sample ID					BH - E	
				Guideline		BH - A	BH - B	BH - C		BH - D
				Lower Limit	Upper Limit	12-Nov-2018 11:40 EM1818185-001	12-Nov-2018 12:30 EM1818185-002	12-Nov-2018 12:45 EM1818185-003		12-Nov-2018 13:00 EM1818185-004
EG005T: Total Metals by ICP-AES										
Arsenic	EG005T	5	ng/kg	----	200	12	12	<5	<5	10
Barium	EG005T	10	ng/kg	----	3000	20	90	40	40	120
Beryllium	EG005T	1	ng/kg	----	40	<1	<1	<1	<1	<1
Cadmium	EG005T	1	ng/kg	----	40	<1	<1	<1	<1	<1
Chromium	EG005T	2	ng/kg	----	500	97	34	20	24	44
Cobalt	EG005T	2	ng/kg	----	200	<2	12	26	16	15
Copper	EG005T	5	ng/kg	----	2000	9	39	38	21	60
Lead	EG005T	5	ng/kg	----	1200	28	200	<5	7	3000
Manganese	EG005T	5	ng/kg	----	5000	36	454	537	437	593
Molybdenum	EG005T	2	ng/kg	----	1000	<2	<2	<2	<2	4
Nickel	EG005T	2	ng/kg	----	600	8	19	119	62	35
Selenium	EG005T	5	ng/kg	----	50	<5	<5	<5	<5	<5
Silver	EG005T	2	ng/kg	----	180	<2	<2	<2	<2	<2
Tin	EG005T	5	ng/kg	----	500	<5	11	<5	<5	25
Zinc	EG005T	5	ng/kg	----	14000	37	200	48	38	156
EG035T: Total Recoverable Mercury by FIMS										
Mercury	EG035T	0.1	ng/kg	----	30	<0.1	0.2	<0.1	<0.1	0.4
EG048: Hexavalent Chromium (Alkaline Digest)										
Hexavalent Chromium	EG048G	0.5	ng/kg	----	200	<0.5	<0.5	<0.5	<0.5	<0.5
EK026SF: Total CN by Segmented Flow Analyser										
Total Cyanide	EK026SF	1	ng/kg	----	1000	<1	<1	<1	<1	4
EK040T: Fluoride Total										
Fluoride	EK040T	40	ng/kg	----	3000	100	150	150	70	100
EP066: Polychlorinated Biphenyls (PCB)										
Total Polychlorinated biphenyls	EP066	0.1	ng/kg	----	20	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)										
Sum of Aldrin + Dieldrin	EP068	0.05	ng/kg	----	20	<0.05	<0.05	<0.05	<0.05	<0.05
Sum of DDD + DDE + DDT	EP068	0.05	ng/kg	----	200	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds										
Sum of Phenols	EP075(SIM)	0.5	ng/kg	----	500	<0.5	<0.5	<0.5	<0.5	<0.5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons										
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	ng/kg	----	40	<0.5	<0.5	<0.5	<0.5	19.3
EP075B: Polynuclear Aromatic Hydrocarbons										



Work Order : EM1818185
 Client : Pitt & Sherry (Operations) Pty Ltd
 Project :

Classification and Management of Contaminated Soil for Disposal

Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Compound	Method	LOR	Unit	Client sample ID		Guideline Lower Limit	Guideline Upper Limit	BH - A 12-Nov-2018 11:40 EM1818185-001	BH - B 12-Nov-2018 12:30 EM1818185-002	BH - C 12-Nov-2018 12:45 EM1818185-003	BH - D 12-Nov-2018 13:00 EM1818185-004	BH - E 12-Nov-2018 13:15 EM1818185-005
				Sampling date/time	Sampling date/time							
Sub-Matrix: SOIL												
EP075B: Polynuclear Aromatic Hydrocarbons - Continued												
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	----	2	<0.05	<0.05	<0.05	<0.05	<0.05	2.88
EP080/071: Total Petroleum Hydrocarbons												
C6 - C9 Fraction	EP080	10	mg/kg	----	----	650	<10	<10	<10	<10	<10	<10
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	----	5000	<50	<50	<50	<50	<50	260
EP080: BTEXN												
Benzene	EP080	0.2	mg/kg	----	----	5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	EP080	0.5	mg/kg	----	----	100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	EP080	0.5	mg/kg	----	----	100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	EP080	0.5	mg/kg	----	----	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5



pitt&sherry

Phase 1 Environmental Site Assessment

Contact

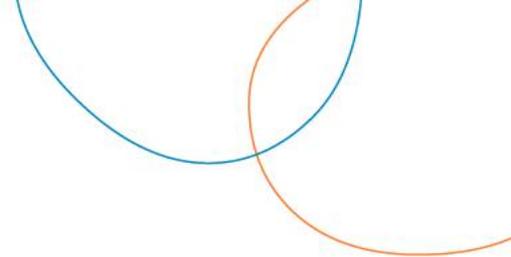
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Located nationally —
Melbourne
Sydney
Brisbane
Hobart
Launceston
Newcastle
Devonport
Wagga Wagga





Construction EMP

Appendix D

pitt&sherry

Construction Environmental Management Plan

Proposed UTAS Pedestrian Bridge, Invermay

Prepared for
University of Tasmania

Client representative
Sam Tucker

Date
27 June 2019

Rev 00



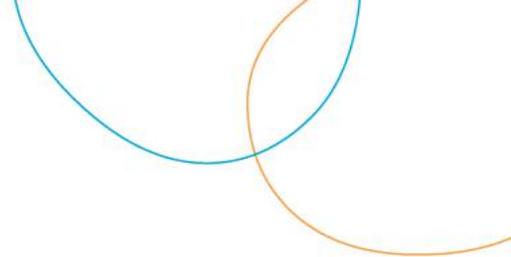


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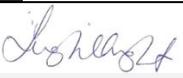
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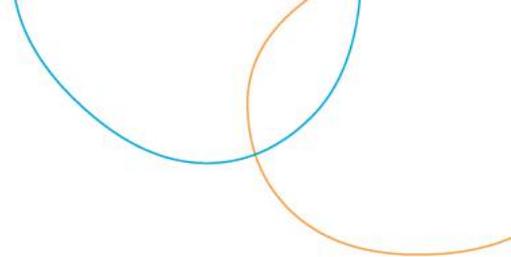
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Appendices

- Appendix A** — Proposed design
- Appendix B** — Flora and Fauna Report

Prepared by — Sophie Le Roux		Date — 27 June 2019
Reviewed by — Leigh Knight		Date — 27 June 2019
Authorised by — Ben Hart		Date — 27 June 2019



Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
00	CEMP	SLR	LK	BH	27/06/2019

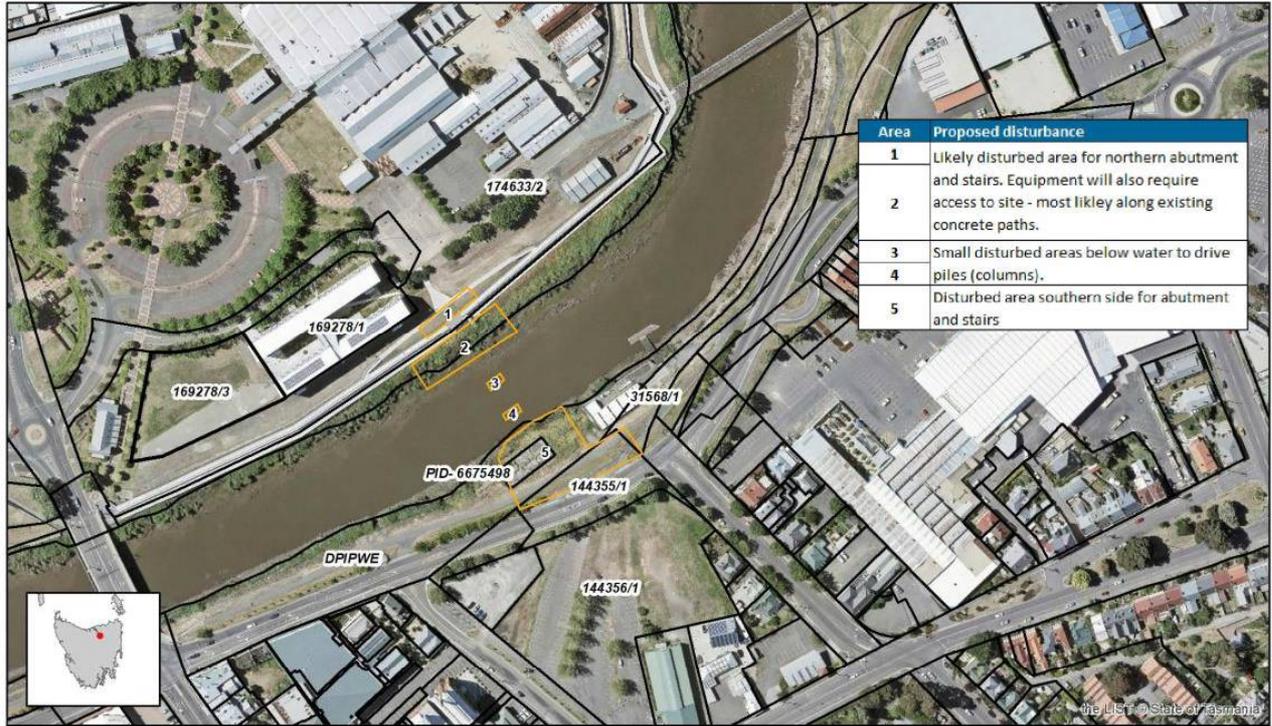
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1. Background

The University of Tasmania (UTAS) is developing a pedestrian-cycle bridge at the UTAS Invermay Campus. **pitt&sherry** were engaged by the University of Tasmania (UTAS) to prepare a Construction Environmental Management Plan (CEMP) for the construction and works associated with the pedestrian-cycle bridge development.

The proposed bridge will occupy small areas on the northern (approximately 150 m²) and southern side (approximately 190 m²) of the North Esk River located in Launceston Tasmania (herein referred to as the 'the site'). The site occupies the river bank and nature strip on either side of the river and part of 21 Boland Street on the southern side and 6 Barnards Way Inveresk, Invermay on the northern side. The construction of the bridge will also involve the advancement of supporting piles at two locations in the river channel. The majority of the site is Department of Primary Industries, Water and Environment (DPIPWE) Crown Land and consists of a nature strip on either side of the North Esk River. The site has been disturbed in the past and hosts a number of declared and environmental weeds. No mature trees are present on site. The site also occupies part of title references 174633/2 on the north shore and title reference 144355/1 and 31568/2 on the southern shore. A Site Location Plan which indicates the land parcels and areas of soil disturbance is provided in Figure 1.



UTAS
 Site Location Plan
 pitt&sherry

N
 0 15 30 60 Meters
 Coordinate System: GDA 1994 MGA Zone 55
 1,2,636 When Printed at A4

MAP REF: LH18249R3
 REVISION: B
 AUTHOR: Klawrence
 DATE: 26/06/2019

DATA SOURCES: Base map from The UST
 Base data from The UST
 Tasmanian Government

Legend
 Proposed bridge design disturbance
 Land Parcels (title reference)

Figure 1- Site location plan

pitt&sherry was engaged by Council to prepare an Environmental Site Assessment (ESA)¹ to support a development application for the bridge development. The ESA included a review of historical land uses and determined that a number of potential sources of contamination existed on site. Preliminary testing identified a localized area of soil contamination (lead and benzo(a)pyrene).

This Construction Environmental Management Plan (CEMP) has been prepared to align with the findings of the ESA to identify potential risks associated with earthworks required during construction, and to outline measures to avoid or mitigate potential impacts.

2. Project Description

It is proposed to construct a pedestrian-cycle bridge over the North-Esk River. Drawings showing the bridge design are attached in Appendix A. The proposed bridge will be constructed in a two-stage process. Stage one will entail construction from the north landing bank/platform spanning to the northern side of Boland Street. Stage one will also include pedestrian connections to the existing shared pathways. Stage two will complete the bridge link over Boland Street and connect to a mid-level floor on the proposed Willis Street Campus building.

2.1 Construction Expected Timeframes

Works will occur over a relatively short timeframe and are expected to be completed by the end of 2020.

¹ Phase 1 Environmental Site Assessment Proposed UTAS Pedestrian Bridge Invermay. pitt&sherry (May 2019)

2.2 Construction Methodology

The bridge is to be built under a design and construct contract under which the final construction methodology and materials will be finalized. The proposed design has been included in Appendix A.

It is expected that no excavation will occur on the northern side of the bridge. Minimal excavation will be required on the southern side at each landing. It is not expected that excavation will extend beyond 1 m in depth.

2.3 Operating Hours

Works will generally be undertaken during the following hours:

Monday to Friday: 7am to 6pm

3. Legislative requirements

A development application is to be submitted for Council approval and works will be required to be conducted in accordance with the planning permit issued and the DA documentation. No approvals under the *Environmental Management and Pollution Control Act 1994* are considered necessary as no significant environmental impacts are likely to result from the proposed works. The following additional legislative requirements may apply:

- a permit to take may be required under the *Threatened Species Protection Act 1995* if threatened plants are to be disturbed by the proposed works
- declared weeds are required to be managed in accordance with the *Weed Management Act 1999*.

Control measures must be put in place by the contractor to prevent the following:

- destruction of native vegetation and threatened species
- discharge of pollutants to the North Esk River
- river bank erosion or collapse
- excessive noise emissions
- excessive dust and air emissions
- release of hazardous chemicals.

4. Surrounding land uses

The proposed works are located on both sides of the North Esk River. The site is surrounded by a mix of light commercial, residential and open parkland uses:

- East: North Esk River with the row club building, Boland Street and Becks Home Timber and Hardware and residential properties approximately 200 m beyond.
- West: North Esk River with UTAS student accommodation, an open storage area, education building and carparking. Invermay Road, retail shops and residential properties are located approximately 250 m beyond.
- North: Queen Victoria Museum with the University of Tasmania Inveresk Campus beyond
- South: Boland Street with open space, parking, with the National Automobile Museum of Tasmania, Crystal Cleaning approximately 100 m beyond.

There are currently no sensitive uses adjoining the site however there are sites either side where workers, residents and students are present on a daily basis. The UTAS student accommodation is adjacent to the site and the university campus extends from the site. These uses should be considered, with access managed through adequate fencing and signage.

The noise generated from the works will be managed by limiting working times between 7am and 6pm. Work will not be undertaken on Sundays. No special control or mitigation measures are considered necessary for noise other than adherence to hours of operation. A complaints protocol is to be developed for the proposed works

Traffic to and from the site associated with the trenching will be limited and is not expected to impact the safety or efficiency of the road network. No special traffic management arrangements are considered necessary.

5. Water

The site is located on either side of the North Esk River. A small concrete slab is located on the southern shore and the river foreshore vegetated. Levees on either side of the river direct any surface runoff adjacent to the channel towards river.

There is no public stormwater infrastructure shown within this the site on The LIST and those services in Boland St are identified as gravity mains.² These are higher than the site and are unlikely to offer any service to the development.

All soils excavated on the southern side of the river are proposed to be contained as described in section 8.2 due to potential contamination. As a result, no leachate or run-off from excavated soils will be generated. If soils are very wet at the time of excavation, some leachate may run from excavated material but the volume of this material is proposed to be low.

Excavation pits are unlikely to stay open long enough to fill with sufficient water to warrant pumping out. However, if significant water was encountered during trenching, pumping may be required followed by adequate disposal due to the close vicinity of the site to the river.

Installation of the piles within the river is likely to increase turbidity and sedimentation during works. The duration of works within the river should thus be reduced where possible. As the works will not be ongoing, any increase in suspended sediments within the river are likely to subside following cessation of works.

Given the relatively limited duration of the excavation works and the limited excavation depth proposed, no significant, long term impacts on water sources is anticipated.

Temporary sediment run-off may be generated following weed removal and site preparation works on the northern side of the river. However, no contamination was identified in soils on that side of the river.

Implementation of standard erosion and sediment control measures, including silt mesh and diversion bunds, will ensure any mobilized sediments do not cause any environmental nuisance.

No refueling will be occurring on site and the activities proposed are not considered to have the potential for the release of fuels or other pollutants. No special precautions are considered necessary.

6. Flora and Fauna Protection

According to TASVEG 3.0 mapping, the vegetation community on the northern river foreshore would be classified as 'agricultural, urban and exotic vegetation' (FWU), with a vegetation community description of 'weed infestation'. Vegetation beyond the river foreshore on the northern bank and the southern side of the river within the site is classified as 'agricultural, urban and exotic' species (FUR) with a vegetation community description of 'urban areas'. The site does not support and vegetation larger than low growing grasses and shrubs, consistent with earthworks which would have occurred during the construction of the levees.

A flora and fauna assessment³ was undertaken at the site of the proposed development. The flora and fauna assessment confirmed that vegetation along the banks of the North Esk River consists of highly disturbed riparian

² LIST Map www.thelist.tas.gov.au. Website accessed January 2019.

³ *University of Tasmania Proposed Footbridge Flora and Fauna Assessment Report (R01)*. Prepared by Umwelt (Australia) Pty Ltd on behalf of Pitt&Sherry, February 2019

vegetation. The findings of the survey were as follows:

- No Threatened Ecological Communities identified under either the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or the *Tasmanian Nature Conservation Act 2002* (NC Act) was recorded in the Study Area.
- No threatened flora as listed under either the Commonwealth EPBC Act or the Tasmanian Threatened Species Protection Act 1995 (TSP Act) were recorded within the Study Area. Assessment of available habitats using the results of the field survey indicates that due to historic disturbance associated with urban development in the Study Area, threatened flora species are considered unlikely to occur.
- No threatened fauna was recorded within the Study Area, during the field survey. The proposed development will not impact any critical habitat elements for any threatened species identified with potential to occur including Tasmanian wedge-tailed eagle, grey goshawk, white-bellied sea-eagle, Australasian bittern or the fish species Australian grayling.
- Implementation of the various mitigation measures proposed under sections 5 and 8 will ensure that impact of sedimentation; siltation and erosion upon the riparian habitats adjacent to the construction area are minimized.

7. Weed Management

Three declared weeds, as listed under the *Weed Management Act 1999* (WM Act), were identified during the flora and fauna assessment²: crack willow, blackberry and Paterson's curse. These weeds must be managed, controlled or eradicated in-line with the WM Act and the Tamar Valley Weed Strategy.⁴ Any clearing for trenching should ensure any other weeds disturbed are disposed of appropriately and not placed in any mulching facilities.

Weed management controls implemented by the construction contractor shall also aim to prevent the spread of weeds on the site and off site and the introduction of the weeds particularly in disturbed areas.

The following weed management controls shall be implemented:

- Prior to works commencing, declared and environmental weeds within the construction area will be controlled by a licensed contractor;
- Prior to entering the construction area all personnel will complete a weed management induction;
- A wash down area will be established on site, and will be maintained to prevent the further spread of declared and environmental weeds. Prior to leaving site, vehicles and/or machinery must be adequately clean to prevent the spread of weeds;
- Soil and vegetative matter from the clean down area is to be removed regularly and stockpiled and/or disposed of to an appropriate site;
- Signage will be established at clean and wash-down points, directing machinery/ vehicle operators to use these facilities;
- Weeds have the potential to germinate in the project area during construction within areas such as around infrastructure, fencing, soil stockpiles, disturbed areas, etc. As such, on-going weed control works will be maintained during construction;
- Any topsoil/bedding that is imported to site is required to be certified weed free (where practicable);
- Any excess soil/fill cannot be used onsite, will be disposed of at a licensed receiving facility or other property with an

⁴ Tamar Valley Weed Strategy Working Group, *Tamar Valley Weed Strategy*, <http://www.weeds.asn.au/>. Website accessed January 2019.

approved planning permit to receive such material;

- Weed-infested stockpiles as well as topsoil which are to be transported away must be covered to protect against further spread and contamination
- Disturbed areas must be re-sown as soon as practicable to minimize the area of exposed soil for weed establishment and spread; and
- Post work monitoring of weeds and any new infestations controlled.

8. Soil Management

The history of development and use across the site means that soils are unlikely to be reflective of original sediments. The area is alluvial in nature and is comprised of estuarine deposits. Some fill material has been imported to the site and various surrounding land uses have resulted in contamination of soils on site. In the site on the southern bank of the of North Esk River, construction and demolition waste was identified. Some litter has also been dumped on the bank. On the northern side of the river, the soil was identified as clay, whilst on the southern side, the soil was a combination of gravel, loam and silt.

8.1 Acid Sulfate Soils (ASS)

The Tasmanian Acid Sulfate Soils Information (TASSI) database accessed via the LIST, identified coastal acid sulfate soil ASS (0-20 m AHD zone) on the site. The northern river shore, and a strip on the southern shore close to the river, had a high probability of costal ASS occurrence. This equates to a >70% chance of occurrence with ASS generally within upper 1 m. No excavation will occur in these areas.

The remainder of the site on the southern side of the river had a low probability of costal ASS occurrence, which corresponds to a 6-70% chance of occurrence. Minimal soil excavation is proposed in these areas and no ASS management plan is considered necessary. However regular visual monitoring of the works area should be undertaken to identify signs of ASS oxidation, such as:

- Unexplained scalding, degradation or death of vegetation
- Unexplained death of aquatic biota
- Formation of the mineral jarosite and other acidic salts in exposed or excavated soils
- Areas of blue-green water or extremely clear water indicating high concentrations of aluminium
- Rust-coloured deposits on plants, banks of drains, waterbodies and watercourses indicating iron precipitates
- Excessive corrosion of concrete and/or steel structures in contact with soil or water
- Black waters indicating deoxygenation
- Sulfurous smells (eg hydrogen sulphide or rotten egg gas).

Sediment under the water will be displaced during pile driving but not removed from the river.

8.2 Potentially Contaminated Soils

Sampling and testing of soils was undertaken by **pitt&sherry** in November 2018 at the location of the proposed soil

excavations.⁵ The results showed a localized area of soil contamination (benzo(a)pyrene and lead) on the southern side of the bridge near the rowing club.

The risk assessment undertaken as part of the environmental site assessment (**pitt&sherry**, 2019) determined that the risk to workers from exposure to the identified contamination was likely to be low. However, the risk can be further reduced by the implementation of standard dust reduction measures and through the use of appropriate personal protective equipment (PPE) during works such as protective clothing, gloves, eye wear and dust masks when conditions require. An operational Workplace Health and Safety (WHS) Plan is to be prepared and implemented. The WHS Plan should include the potential presence of asbestos in soils (although no asbestos was visually identified during the site assessment).

All excavated soils should be treated as potentially contaminated. Excavated soil shall be placed in a water tight skip bin with a lid to prevent the ingress of water or wrapped in plastic and contained within an earth bund. The materials should be inspected and sampled by an appropriately qualified person for waste classification purposes. The soil analytical results should be compared against the EPA Tasmania *Information Bulletin No.105, Classification and Management of Contaminated Soil for Disposal* (Version 3, 2018) and managed accordingly. Soils found to be contaminated will be disposed of off-site at an appropriately authorized waste facility (based on the contamination levels). Management and transport of the soil would have to be subject to EPA approvals.

An Unexpected Finds Protocol should be prepared and implemented where suspected contaminated or hazardous materials are encountered during excavation works.

River Sediment

It is expected that sediments will not be removed during pile driving (under the water). Sediment will be displaced but will not be extracted from the river. Pile driving shall be completed in a way that minimises sediment disturbance where possible. However, it is expected that sediment will be displaced and an increase in turbidity may also occur temporarily. The installation of piles within the river and will not increase workers exposure.

9. Operational Requirements

Dust minimisation measures should be implemented to mitigate potential impacts on construction workers and pedestrians. Public access should be restricted around the work area and excavations to minimise the potential for exposure to dust borne contaminants and to prevent injury.

Staff and visitors are to be inducted into the WHS Plan and the required protective measures required relating to potential soil contamination on site.

A complaints and communications strategy is to be developed with all complaints being referred to the project manager for immediate action.

An incident reporting procedure will be implemented to record, investigate and report any spills or unscheduled discharges. In the event that an incident occurs, the project manager is to co-ordinate corrective actions. Contingency measures will be developed based on the incident requirements (for example erecting bunds around excavation areas, lining for drainage systems).

10. Summary of Mitigation Measures

Measures to be implemented to avoid or mitigate impacts potentially occurring from the works are summarised in Table 1.

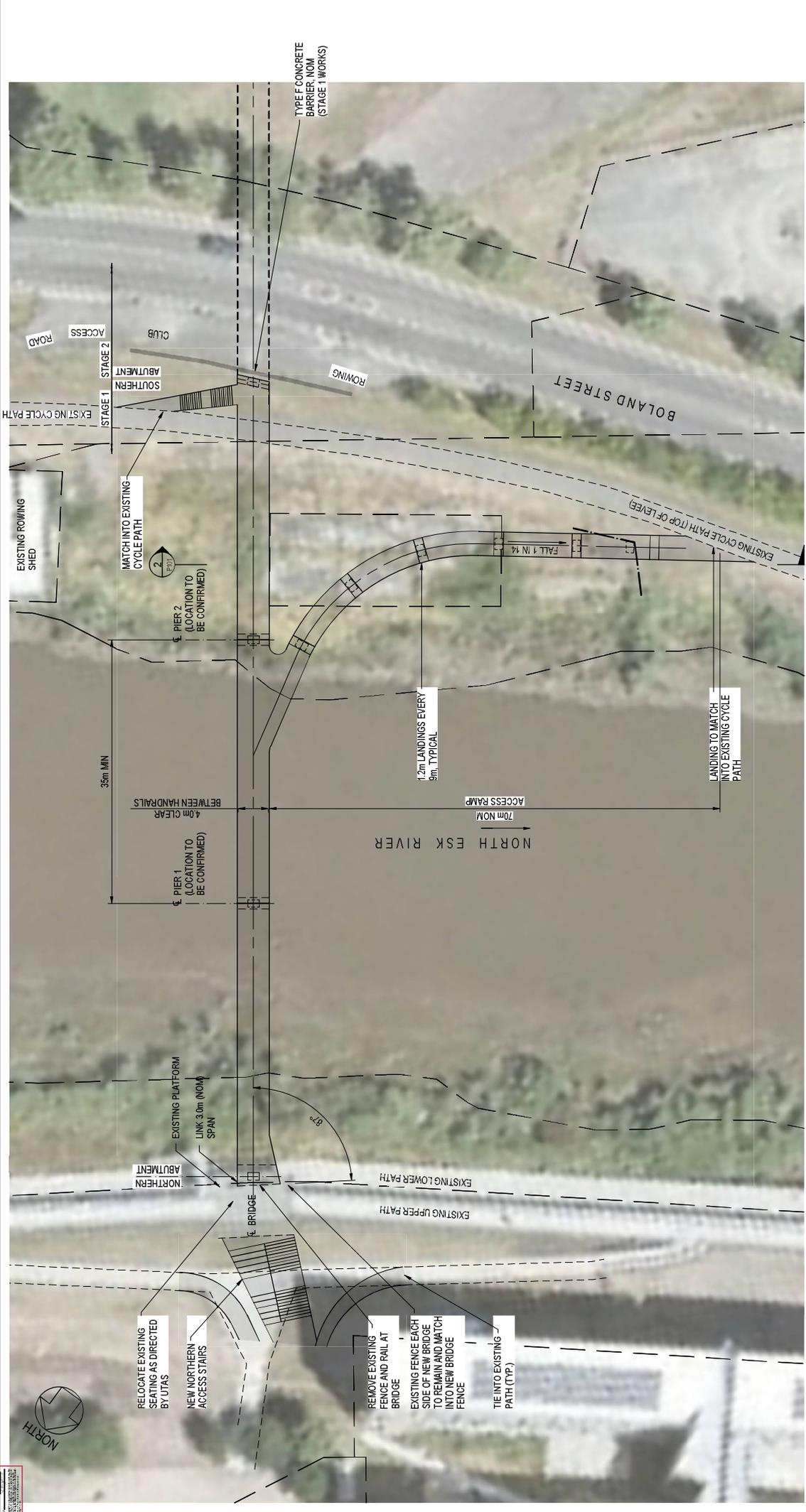
⁵ Phase 1 Environmental Site Assessment Proposed UTAS Pedestrian Bridge Invermay. **pitt&sherry** (May 2019)

Table 1 Summary of mitigation measures

Potential Impact	Mitigation Measure
Water	<ul style="list-style-type: none"> • Appropriate erosion and sediment control measures • Silt mesh barriers if sediments are saturated • Diversion bunds if trenches are to remain open for extended periods
Vegetation Management	<ul style="list-style-type: none"> • Implementation of weed management control measures (refer to Section 7)
Contaminated soil	<ul style="list-style-type: none"> • Prepare and implement WHS Plan and task specific Safe Work Method Statements • Use of appropriate PPE by all personnel on site when required, to prevent direct contact with soil and dust inhalation • Excavated soil to be treated as potentially contaminated, placed in a water tight skip bin with a lid, or wrapped in plastic and contained within an earth bund • Excavated soil to be inspected and tested by an appropriately qualified person for waste classification purposes • Soils to be classified in accordance with EPA Information Bulletin No.105 and managed and disposed according to the classification level. Remove contaminated material to an approved disposal facility (pending results and EPA approval).
Dust and Air Emissions	<ul style="list-style-type: none"> • Implement dust minimisation measures • Public access to be restricted • Preparation and implementation of WHS Plan • Site inductions for personnel and visitors • Use of appropriate PPE by all personnel on site when required • Return excavated fill to trenches as soon as practical (if no contamination identified)
Soil Management	<ul style="list-style-type: none"> • Standard erosion and sediment control measures • Visual monitoring of the works area should be undertaken to identify signs of acid sulfate soil oxidation (refer to section 8.1) • Implement Unexpected Finds Protocol.
Noise Impacts	<ul style="list-style-type: none"> • Adherence to hours of operation • All machinery to be in good working order with appropriate noise attenuation devices fitted • Follow up on any complaints received in accordance with complaints procedure

Plans of the proposed bridge

Appendix A



PLAN
 SCALE 1:500

REFERENCE FILES ATTACHED: L:\work\Eska\Crossbridge_LIN18249-X1800_LIN18249-X1000_LIN18249-X1850_LIN18249-X1850_LIN18249-X1850

NO.	DESCRIPTION	DRAWN	DESIGNED	REVIEWED	DATE

SCALE (POSTED FULL SIZE)	AS SHOWN (A3)	SHEET SIZE
5000	0 5000 10000 15000 20000	A3

SCALE IN MILLIMETRES - 1:500

APPROVED: [Signature] ORIGINAL COPY ON FILE
 DESIGNED BY: [Signature] CHECKED BY: [Signature]

SCALE	DATE

CLIENT: UNIVERSITY OF TASMANIA
 PROJECT: INVERESK PEDESTRIAN CYCLE BRIDGE
 INVERESK LAUNCESTON
 DRAWING NO: LIN18249-P110
 DATE: JUN. 27. 19. 13
 DRAWING TITLE: GENERAL ARRANGEMENT - STAGE 1
 PROPERTY BOUNDARY PLAN
 DWT/MS: AHD/JMCA
 QUANTITY: A
 REVISION: A

STATUS: PRELIMINARY

I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF TASMANIA AND I AM A MEMBER OF THE ENGINEERING COUNCIL OF AUSTRALIA. I AM NOT PROVIDING ANY SERVICES IN ANY OTHER JURISDICTION.

Leigh

From: aboriginal@heritage.tas.gov.au
Sent: Monday, 1 July 2019 11:56 AM
To: Leigh
Subject: Application for an Aboriginal Heritage AH Desktop Review
Attachments: Unanticipated Discovery Plan.pdf

RE: ABORIGINAL HERITAGE DESKTOP REVIEW

Pedestrian Bridge - Inveresk

Dear Leigh,

Aboriginal Heritage Tasmania (AHT) has completed a search of the Aboriginal Heritage Register (AHR) regarding the proposed pedestrian bridge at Inveresk and can advise that there are no Aboriginal heritage sites recorded within or close to the proposed works area. Following a review of previous reports, and due to the area being highly disturbed, it is believed that there is a low probability of Aboriginal heritage being present.

Accordingly there is no requirement for an Aboriginal heritage investigation and AHT have no objection to the project proceeding.

Please be aware that all Aboriginal heritage is protected under the *Aboriginal Heritage Act 1975*. If at any time during works you or your works personnel suspect Aboriginal heritage, cease works immediately and contact AHT for advice. Attached is an Unanticipated Discovery Plan, which you should have on hand during ground disturbing works, to aid you and your works personnel in meeting your requirements under the Act.

If you have any queries please do not hesitate to contact AHT.

Kind Regards,

Claire Keating

Aboriginal Heritage Tasmania
Department of Primary Industries, Parks, Water and Environment
3rd Floor, Lands Building, 134 Macquarie Street, Hobart
GPO Box 44, Hobart, TAS, 7001

p 03 6165 3152
e aboriginal@heritage.tas.gov.au

www.aboriginalheritage.tas.gov.au



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Unanticipated Discovery Plan

Procedure for the management of unanticipated discoveries of Aboriginal relics in Tasmania

For the management of unanticipated discoveries of Aboriginal relics in accordance with the *Aboriginal Heritage Act 1975* and the *Coroners Act 1995*. The Unanticipated Discovery Plan is in two sections.

Discovery of Aboriginal Relics other than Skeletal Material

Step 1:

Any person who believes they have uncovered Aboriginal relics should notify all employees or contractors working in the immediate area that all earth disturbance works must cease immediately.

Step 2:

A temporary 'no-go' or buffer zone of at least 10m x 10m should be implemented to protect the suspected Aboriginal relics, where practicable. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected Aboriginal relics have been assessed by a consulting archaeologist, Aboriginal Heritage Officer or Aboriginal Heritage Tasmania staff member.

Step 3:

Contact Aboriginal Heritage Tasmania on **1300 487 045** as soon as possible and inform them of the discovery. Documentation of the find should be emailed to **aboriginal@heritage.tas.gov.au** as soon as possible. Aboriginal Heritage Tasmania will then provide further advice in accordance with the *Aboriginal Heritage Act 1975*.

Discovery of Skeletal Material

Step 1:

Call the Police immediately. Under no circumstances should the suspected skeletal material be touched or disturbed. The area should be managed as a crime scene. It is a criminal offence to interfere with a crime scene.

Step 2:

Any person who believes they have uncovered skeletal material should notify all employees or contractors working in the immediate area that all earth disturbance works cease immediately.

Step 3:

A temporary 'no-go' or buffer zone of at least 50m x 50m should be implemented to protect the suspected skeletal material, where practicable. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected skeletal remains have been assessed by the Police and/or Coroner.

Step 4:

If it is suspected that the skeletal material is Aboriginal, Aboriginal Heritage Tasmania should be notified.

Step 5:

Should the skeletal material be determined to be Aboriginal, the Coroner will contact the Aboriginal organisation approved by the Attorney-General, as per the *Coroners Act 1995*.



Guide to Aboriginal site types

Stone Artefact Scatters

A stone artefact is any stone or rock fractured or modified by Aboriginal people to produce cutting, scraping or grinding implements. Stone artefacts are indicative of past Aboriginal living spaces, trade and movement throughout Tasmania. Aboriginal people used hornfels, chalcedony, spongelite, quartzite, chert and silcrete depending on stone quality and availability. Stone artefacts are typically recorded as being 'isolated' (single stone artefact) or as an 'artefact scatter' (multiple stone artefacts).

Shell Middens

Middens are distinct concentrations of discarded shell that have accumulated as a result of past Aboriginal camping and food processing activities. These sites are usually found near waterways and coastal areas, and range in size from large mounds to small scatters. Tasmanian Aboriginal middens commonly contain fragments of mature edible shellfish such as abalone, oyster, mussel, warrener and limpet, however they can also contain stone tools, animal bone and charcoal.

Rockshelters

An occupied rockshelter is a cave or overhang that contains evidence of past Aboriginal use and occupation, such as stone tools, middens and hearths, and in some cases, rock markings. Rockshelters are usually found in geological formations that are naturally prone to weathering, such as limestone, dolerite and sandstone

Quarries

An Aboriginal quarry is a place where stone or ochre has been extracted from a natural source by Aboriginal people. Quarries can be recognised by evidence of human manipulation such as battering of an outcrop, stone fracturing debris or ochre pits left behind from processing the raw material. Stone and ochre quarries can vary in terms of size, quality and the frequency of use.

Rock Marking

Rock marking is the term used in Tasmania to define markings on rocks which are the result of Aboriginal practices. Rock markings come in two forms; engraving and painting. Engravings are made by removing the surface of a rock through pecking, abrading or grinding, whilst paintings are made by adding pigment or ochre to the surface of a rock.

Burials

Aboriginal burial sites are highly sensitive and may be found in a variety of places, including sand dunes, shell middens and rock shelters. Despite few records of pre-contact practices, cremation appears to have been more common than burial. Family members carried bones or ashes of recently deceased relatives. The Aboriginal community has fought long campaigns for the return of the remains of ancestral Aboriginal people.

Further information on Aboriginal Heritage is available from:

Aboriginal Heritage Tasmania
Natural and Cultural Heritage Division
Department of Primary Industries, Parks, Water and Environment
GPO Box 44 Hobart TAS 7001
Telephone: **1300 487 045**
Email: **aboriginal@heritage.tas.gov.au**
Web: **www.aboriginalheritage.tas.gov.au**

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