



## Kingborough Council

### Public Safety Risk Assessment Report

### Blackmans Bay Cliff

October 2019

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## EXECUTIVE SUMMARY

IPM Consulting Services (IPM) was engaged by Kingborough Council to undertake a public safety risk assessment to determine the risk exposure to the organisation with respect to the study area.

The study area included Talone Road (south of 36 Talone Road), Blackmans Bay Blowhole Reserve, Blackmans Bay headland reserve, and the northern extremity of Blackmans Bay Beach, Blackmans Bay.

The principal objective of the assessment was to determine:

- the public safety risks associated with the blowhole and cliff top at Blackmans Bay;
- the controls in place to manage the risk; and
- any additional improvements to reduce the risk to as low as reasonably practicable.

The primary activities that occur at the study area are known to be:

- Sightseeing at the expansive views over the River Derwent.
- General use - walking and recreational activities.
- Abseiling by tourist operators, community groups and schools.
- Cliff Jumping – reported instances of risk-takers jumping off the cliff edge on Talone Road into the 5-metre gap in the rock outcrop where the water enters the blowhole.

The potential for the area to be used to commit suicide was also considered through the assessment.

The most significant public safety hazards for the area were identified as:

- Falls from cliff edge and blowhole edge
- Injury due to unstable cliff face (base of cliff) - falling rocks
- Injury due to falling tree limbs
- Injury from pedestrian and traffic interaction – Talone Road and Blowhole Road
- Slips / Trips – uneven paths and unofficial paths

It was concluded that based on the current preventative control measures the public safety risk of the study area is rated as significant.

The following recommended improvements to reduce the risk were categorised into short-term and long-term actions based on priority and ease of implementation:

### Short-term

- Conduct a Geotechnical review of the blowhole and cliffs in accordance with the Landslide Risk Management standard released by the Australian Geomechanics Society in 2007.
- Install a new fence along the cliff top with controlled access to the cliff side of the fence for authorised persons.
- Install engineered certified anchor points for abseiling.
- Install warning signs on cliff top and base of cliff which is compliant with AS/NZS 2416.1 2010.
- Conduct education program for selected groups (e.g. schools, community and tourist

organisations) on hazards and consequences of the area. Include a public awareness campaign on the council website.

- Include trees along Talone Road clifftop and newly acquired Blowhole reserve in the Council's arborist assessment and maintenance schedule.

#### Long-term

- Install amenity lighting for the pathways and frequently used spaces.
- Improve pathway and steps in blowhole reserve to remove trip hazards
- Redesign the pedestrian and vehicular interface along Blowhole Road, south of the Blowhole reserve
- Install stairway or block pathway with vegetation on unofficial path down to beach.

It is also recommended that Kingborough Council develop and implement a monitoring program to ensure the controls once implemented are maintained to the appropriate standard.

The implementation of the above recommendations will also improve the effectiveness of the current controls.

These improvements will significantly reduce the risks for a reasonable person and slightly reduce the risk of a risk-taker.

It is recommended that Kingborough Council use a similar process of risk assessment for comparable locations under the Council's control.

**Signed:**



**Thomas Lamond**

Senior WHS Consultant

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## 1. INTRODUCTION

Kingborough Council engaged IPM to undertake a public safety risk assessment to determine the risk exposure to the organisation with respect to the blowhole and cliff top at Blackmans Bay. The risk assessment included discussions with key council representatives to determine the risk level, the current controls which are critical to mitigating the risk and additional measures to reduce the risk.

### 1.1. Objectives

The principal objective of the assessment was to determine:

- the public safety risks associated with blowhole and cliff top at Blackmans Bay;
- the controls in place to manage the risk; and
- any additional improvements to reduce the risk to as low as reasonably practicable.

### 1.2. Relevant Regulations

The following regulations apply:

*Local Government Act 1993 (Tas):*

Section 20 Functions and powers

- (1) (a) a council has the function to provide for the health, safety and welfare of the community.

Kingborough Council also has a general duty of care under common law to take reasonable care to avoid injury to a person whom, it can be reasonably foreseen, might be injured by an act or omission.

## 2. STUDY AREA

The assessment encompassed the area including Talone Road (south of 36 Talone Road), Blackmans Bay Blowhole Reserve, Blackmans Bay headland reserve, and the northern extremity of Blackmans Bay Beach, Blackmans Bay (see figure 1).

The subject site includes the publicly accessible streetscape of Talone Road and several cliff-top open spaces, including locations that provide attractive prospect over the River Derwent, Blackmans Bay, and surrounding areas.

Ownership of the land (north of the Talone Road turnaround), located directly east of Talone Road, is held under freehold titles associated with the Lots opposite. This section was included in the risk assessment study area as it is readily accessible to the public and there are no discerning features to distinguish it as private land.

The subject site includes undulating topography; sharp, and often concealed, cliff edges; significant vertical relief; rocky outcrop; the shoreline marine shelf (to base of cliffs); established coastal vegetation; a bitumen carriageway and turnaround; footpaths; and limited park furniture.

The study area is limited to the council jurisdiction of the cliff top and the base of the cliffs. The rock formations along the shoreline were not considered as a part of the risk assessment, except any consequential hazards originating from the cliffs above these formations (e.g. rockfall from the cliff face), as these are under the jurisdiction and control of Department of Primary Industries, Parks, Water and Environment.



Figure 1: Aerial view of study area

### 3. BACKGROUND

An accidental death occurred at the subject site on 28 January 2017 where the deceased fell from the cliff edge after landing awkwardly from climbing the fence. A subsequent Record of Investigation into Death (Without Inquest) conducted by the Coroner, recommended an assessment of management and safety of the public area comprising the blowhole and the cliff face area from Blackmans Bay beach to its end point on Talone Road. The Kingborough Council acquired the land directly south of the Talone Road turnaround and north of Blackmans Bay Beach in response to the Coroner's recommendations.<sup>1</sup>

#### 3.1. Activities

The primary activities that the clifftop at Talone Road area and the headland reserve park are used by the public for are:

- Sightseeing at the expansive views over the River Derwent.
- General use - walking and recreational use.
- Abseiling by tourist operators, community groups and schools.
- Cliff Jumping – reported instances of risk-takers jumping off the cliff edge on Talone Road into the 5-metre gap in the rock outcrop where the water enters the blowhole.

From the data available, there are no known reported cases of suicide at the study area. The reported incidents show that the clifftop is a location where those with the intent to commit suicide are drawn. For this reason, suicide was considered as a part of the assessment.

<sup>1</sup>Olivia McTaggart, 'Record of Investigation into Death (Without Inquest)', Magistrates Court of Tasmania Coronial Division, 26 February 2019.

### 3.2. Reported incidents

There have been numerous recorded incidents and “general knowledge” of high-risk activities within the Kingborough Council region associated with activities near or on the various clifftops. This data has been gathered from the Kingborough Council and Tasmania Police (Kingston station) records (note - the police records system was changed in 2017 and data can only be readily sourced back to this date from this system).

## 4. METHOD

IPM’s Senior WHS Consultants facilitated a public safety risk assessment workshop with Kingborough Council representatives on 22<sup>nd</sup> October 2019. The participants involved were:

- Cr Dean Winter, Mayor
- Daniel Smee, Executive Manager Governance and Community Services
- David Reeve, Executive Manager Engineering Services
- Tim Jones, Finance Manager
- Paul Donnelly, Urban Design Officer
- Su Sprott, Recreation Officer
- Scott Rollins, Co-ordinator Parks and Reserves (Works Depot)
- David Pitt, Supervisor Parks and Reserves (Works Depot)
- Gary Lebsanft – Senior WHS Consultant – IPM Consulting Services
- Kate Smith - Senior WHS Consultant – IPM Consulting Services
- Thomas Lamond – Senior WHS Consultant – IPM Consulting Services

The workshop focused on the hazards to the public, causes, and effectiveness of current controls for the study area. This analysis lead to an assessment of the current level of health and safety risk and recommended improvements to reduce the level of health and safety risk.

The standard used to assess the adequacy of controls was reasonably practicable as defined in the *Work Health and Safety Act 2012* (Tas) which means:

That which is (or was at a particular time) reasonably able to be done to ensure WHS, taking into account and weighing up all relevant matters including:

- the likelihood
- the degree of harm
- what is known (or ought to reasonably be known) about the hazard or risk and about ways of removing or reducing it
- the availability and suitability of ways to reduce the risk
- the cost

The risk assessment workshop followed the risk management process in “How to Manage Work Health and Safety Risks Code of Practice” – SafeWork Australia and used the Kingborough Council WHS Risk Matrix (see Attachment 2) for the rating of risks.

#### 4.1. Document review

The following documents were reviewed as a part to the assessment process:

- 'Record of Investigation into Death (Without Inquest)', Magistrates Court of Tasmania Coronial Division, 26 February 2019
- Clarence Council Meeting Minutes, Monday 21 October 2019.
- ETS Environmental and Technical Services - Geotechnical Inspection - 4 May 1999.
- Risk Management Report - Headlands Track (Blackmans Bay) (no date)
- The Mercury, 'Teen falls to her death from cliff at Blowhole Road in Blackmans Bay', 30 January 2017 <<https://www.themercury.com.au/news/tasmania/teen-falls-to-her-death-from-cliff-at-blowhole-road-in-blackmans-bay/news-story/6e4a11dc3831437ddbb4cf31a3fd6880>>
- The Mercury, 'No new safety measures at Blackmans Bay blowhole, nearly 12 months after death', 18 December 2017 <<https://www.themercury.com.au/news/tasmania/no-new-safety-measures-at-blackmans-bay-blowhole-nearly-12-months-after-death/news-story/55da8037942125dcfcc08603856205ac>>
- The Mercury, 'NSW teen's death at Blackmans Bay Blowhole an 'absolute tragedy', say Tasmania Police', 22 December 2017 <<https://www.themercury.com.au/news/national/nsw-teens-death-at-blackmans-bay-blowhole-an-absolute-tragedy-say-tasmania-police/news-story/b9397e06f0b10515cd45121ffc8b34c1>>
- ABC News, 'Blackmans Bay cliff death: Calls for fence upgrade after teenager Margaret Lore's fatal fall', 30 January 2017 <<https://www.abc.net.au/news/2017-01-30/call-for-better-fencing-at-blackmans-bay-cliff-where-teen-fell/8221424>>
- ABC News, 'Hobart news: Fatal accident spot to have signage within a month, uni report into abuse released', 9 July 2019 <<https://www.abc.net.au/news/2019-07-09/tas-daily-briefing-tuesday-9th-july/11289910>>
- NSW Department of Planning, Industry and Environment, 'Wedding Cake Rock bolstered with new fence to help stop dangerous selfies', 21 June 2019 <<https://www.environment.nsw.gov.au/news/wedding-cake-rock-bolstered-with-new-fence-to-help-stop-dangerous-selfies>>
- The Sydney Morning Herald, 'Mayor's plea in wake of deadly cliff falls: 'Stick to designated areas'', 25 July 2018 <<https://www.smh.com.au/national/nsw/mayor-s-plea-in-wake-of-deadly-cliff-falls-stick-to-designated-areas-20180724-p4ztec.html>>
- AS/NZS 1158.3.1:2005 Lighting for roads and public spaces - Pedestrian area (Category P)
- AS/NZS 2416.1:2010 Water safety signs and beach safety flags Part 1: Specifications for water safety signs used in workplaces and public areas
- AS 2156.2:2001 Walking tracks Part 2: Infrastructure design

- Tasmanian Coastal Works Manual - Guidelines, Fencing G-13.4  
<[https://dpiwwe.tas.gov.au/Documents/Tasmanian\\_Coastal\\_Works\\_Manual\\_Guideline\\_134\\_Fencing.pdf](https://dpiwwe.tas.gov.au/Documents/Tasmanian_Coastal_Works_Manual_Guideline_134_Fencing.pdf)>

## 5. RISK ASSESSMENT FINDINGS

The study area was divided into three distinct sections for the assessment:

1. Property north of Talone Road turnaround, including private property and public road (Talone Road), parking areas, fence, trees and cliff face.
2. Blowhole reserve park area including blowhole, seating, fallen trees, path, fence and cliff.
3. Walking area near street to the south of the blowhole reserve along Blowhole Road.

### 5.1. Private property and public road (Talone Road)

The cliff top in this section is primarily privately-owned free hold titles associated with the Lots opposite. The health and safety risk rating and controls were assessed independent of ownership.

The assessment was based on the activities which occur at this section of the study area:

- Sightseeing
- Abseiling
- Risk taking – cliff diving
- Mental health – Suicide

The main risk, a fall from the cliff resulting in death, was rated as a significant risk based on the historical data of incidents and the current controls that are in place; inconsistent fencing and the inadequate warning signage.

The following are recommended improvements to the controls for this risk:

- Update and implement geotechnical assessment of blowhole and cliff
- Install an appropriate (see section 7.2 below) fence along cliff with controlled access
- Improve / Additional signage
- Engineered / certified anchor points for abseiling
- Implement an authorisation process for controlled access to the cliff side of the fence line (i.e. for abseilers and council workers)
- Install lighting for amenity – street and pedestrian (Lighting assessment)

The reduced risk rating (i.e. with added controls) is best described by separate assessments based on the types of people who use the area for the different purposes:

- For the reasonable person the implementation of standardised barriers (fencing) and signage will reduce from Significant to Low
- For children the implementation of standardised barriers (fencing) and signage will reduce from Significant to Low
- For abseilers the implementation of standardised barriers (fencing), controlled access and

Standardised /Certified anchor points will reduce the likelihood of fall from unlikely to rare however the risk rating remains Significant.

- For a person with reduced capacity due to inebriation with the installation of a barrier fence (as per section 7.2) will reduce the likelihood of fall from unlikely to rare however the risk rating remains Significant.
- For the thrill seeker (e.g. cliff diving) and those with mental health issues (suicidal) the risk rating will be only slightly reduced. This group still has the capability to climb the fence.

Other identified risks relevant to this section are:

- Potential to fall while climbing the fence: current risk rating – High
- Unstable cliff face (falling rocks) - Significant
- Injury due to falling tree limbs - Significant
- Injury from pedestrian and traffic interaction – Moderate
- Slips / Trips from uneven ground - Moderate

The same treatment measures as the fall from the cliff were applicable for the first two risks, which would reduce the risk of the potential to fall while climbing the fence to a significant.

The Injury from pedestrian and traffic interaction on Talone Road and slips / trips from uneven ground already has a rectification plan. The Council has already approved capital works for an upgrade to Talone Road which includes designated pathways. Street lighting is not included within this scope of works, therefore a review of lighting is also recommended.

A recommended control for the injury due to falling tree limbs is to include cliff edge trees in assessment and maintenance schedule for the council. It is acknowledged that many if not all these trees are on private land in this section and that the maintenance of these trees will likely have to be negotiated with the landowners.

## **5.2. Blowhole reserve park area**

The risks and recommended control measures associated with the Blowhole reserve park area were the same as those for Talone Road except there is no pedestrian and traffic interaction in the Blowhole park area.

The additional risk identified was the potential to fall over the blowhole edge. This location has a larger fence (about 1.8m - see Attachment 3 – Photo 4) surrounding the blowhole and does not have the same appeal for risk-takers and is not used by abseilers therefore it was rated as a slightly lower risk and the controls were deemed adequate.

An additional control to improve the quality of the paved pathways within the park was included to reduce the risk of a trip hazard due to the uneven paths (see Attachment 3 - Photo 5)

## **5.3. South of reserve along Blowhole Road**

There were two risks identified for the section south of the blowhole reserve along Blowhole Road.

Firstly, the risk of the proximity of cars to pedestrians and cyclists (see Attachment 3 – Photo 6) which was rated moderate. It is recommended that the pedestrian and vehicular interface is redesigned to provide a physical barrier between pedestrians and vehicles.

Secondly, there was a risk of slip or trip when using the unofficial path to beach (see Attachment 3 – Photo 7), this was also rated moderate. One of the causes for the use of this path was thought to be the lack of a physical barrier between vehicle and pedestrians on the current path, therefore a redesigned pedestrian and vehicular interface may go part way to alleviating this risk. Further controls identified were to install a path and stairs in this location to provide for better access or install a vegetation barrier to prevent access.

## **6. RECOMMENDED RISK TREATMENT MEASURES**

Based on the risk assessment, the following recommended risk treatment measures were identified to standardise or improve the current control measures and further reduce the risk. These measures have been categorised into short-term and long-term actions based on priority and ease of implementation.

### Short-term

- Conduct a Geotechnical review of the blowhole and cliffs in accordance with the Landslide Risk Management standard released by the Australian Geomechanics Society in 2007.
- Install a new fence along the cliff top with controlled access to the cliff side of the fence for authorised persons.
- Install engineered certified anchor points for abseiling.
- Install warning signs on cliff top and base of cliff which is compliant with AS/NZS 2416.1 2010.
- Conduct education program for selected groups (e.g. schools, community and tourist organisations) on hazards and consequences of the area. Include a public awareness campaign on the council website.
- Include trees along Talone Road clifftop and newly acquired Blowhole reserve in the Council's arborist assessment and maintenance schedule.

### Long-term

- Install amenity lighting for the pathways and frequently used spaces.
- Improve pathway and steps in Blowhole reserve to remove trip hazards
- Redesign the pedestrian and vehicular interface along Blowhole Road, south of the Blowhole reserve
- Install stairway or block pathway with vegetation on unofficial path down to beach.

## **7. KEY DETAILS AND DISCUSSION ON RECOMMENDATIONS**

### **7.1. Geotechnical review**

A previous geotechnical assessment of the Blackmans Bay Blowhole was conducted in 1999. This assessment identified actions for the council to undertake to slow the rate of erosion. This assessment is also focused on the blowhole risks and does not include the cliffs. Also, since this assessment it was reported that a new fence has been erected at the blowhole because the old fence collapsed due to erosion which indicates continued erosion issues.

It is recommended that Kingborough Council engage a geotechnical specialist to conduct an assessment in accordance with the Landslide Risk Management standard released by the Australian Geomechanics Society in 2007.

This assessment will inform:

- the position of fencing and requirements for anchoring the fence posts;
- location and requirements for anchor points for abseiling;
- risk of rock falls; and
- potential further control measures that may be required.

## **7.2. Fencing**

While fencing won't prevent all persons from accessing the cliff edge (for example see articles on wedding cake rock<sup>2</sup>), it creates a physical barrier which requires a conscious effort by a person to breach.

### **7.2.1. Type**

It is recommended that it is a barrier/fence compliant with Type A, AS2156.2 2001-Walking Tracks Infrastructure Design. The fencing is to be installed the length of the study area from Talone Road to where it is deemed the effective fall height is reduced to below 1 m. The ends of the fence will extend past the cliff edge to prevent the public from walking around the fence edge.

Consideration in the design must be given to providing adequate space in the cliff side of the fence for:

- Abseilers to safely setup and conduct their activity; and
- Council workers to perform maintenance tasks as required.

### **7.2.2. Height**

Height is an effective mental barrier to reasonable people.<sup>3</sup> Consideration must also be given in particular to the risk-taker group with regard to fence height which, if made too high, can increase the risk of falling for this group as they will still climb the fence or climb the cliff face to reach the cliff edge.

The fence must be at least 1.2m high where a 2.5m setback from the cliff face is achievable. A minimum 1.8m high fence is needed for locations where this setback cannot be achieved.

### **7.2.3. Controlled Access**

The fence will include an access gate which is controlled by Kingborough Council through a physical lock and an authorisation process to gain access through this point.

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<sup>2</sup> e.g. NSW Department of Planning, Industry and Environment, 'Wedding Cake Rock bolstered with new fence to help stop dangerous selfies', 21 June 2019 <<https://www.environment.nsw.gov.au/news/wedding-cake-rock-bolstered-with-new-fence-to-help-stop-dangerous-selfies>>

<sup>3</sup> Tasmanian Coastal Works Manual - Guidelines, Fencing G-13.4  
<[https://dpipwe.tas.gov.au/Documents/Tasmanian\\_Coastal\\_Works\\_Manual\\_Guideline\\_134\\_Fencing.pdf](https://dpipwe.tas.gov.au/Documents/Tasmanian_Coastal_Works_Manual_Guideline_134_Fencing.pdf)>

### 7.3. Anchor Points

Engineered and certified anchor points for abseiling are to be installed in a suitable location in consultation with the geotechnical report and the Tasmanian Climbing Instructors Association.

### 7.4. Lighting

Provide amenity lighting which focuses on reserve area and pathways, away from cliff edge and consider spot lighting of signage.

The positives for lighting this area are:

- visual awareness;
- extra passive surveillance;
- behavioural change/self-correction;
- health benefits (winter /after dark use)

The potential negative impact is that it may encourage after dark use for risk takers (night-time jumping), however it was considered the positive impacts both outweigh and provide a level of control against this outcome.

### 7.5. Warning Signs

Signage in compliance with AS/NZS 2416.1 2010 Water safety signs and beach safety flags Part 1: Specifications for water safety signs used in workplaces and public areas is required in strategic positions around pathways, along the fencing and at the base of the cliff to warn of the danger due to fall from cliff edge and falling rocks.

- WSW 010 – Warning Unstable Cliff Edge
- WSW011 – Warning Unstable Cliff

### 7.6. Install stairway or block path

The unofficial pathway from Blowhole Road to the beach presents a slip/trip/fall hazard to the public. A staircase is recommended to provide a lower risk access for this trail. However, it is noted that the natural resource management authority, NRM South, may not allow the construction of a path and stair in this location due to concerns over penguin access.

If the path and stairs are not permitted, it is recommended that the alternative is the installation of a dense vegetation barrier to prevent access.

## 8. CONTROL MONITORING PROGRAM

It is further recommended that Kingborough Council develop a monitoring program to ensure the controls once implemented are maintained to the appropriate standard.

## 9. HEALTH AND SAFETY RISK TO WORKERS

The focus of the risk assessments was on the health and safety of the public. Council workers and contractors were not included as a part of this assessment. Where workers are required to perform tasks, which relate to the hazards identified at this location, Kingborough Council must conduct a risk assessment to determine suitable controls for each task.

## 10. ATTACHMENTS

### 10.1. Attachment 1 – Public Safety Risk Assessment

Hazard Description	Causes	History, Data, Comments	Existing Controls	Current Risk Rating	New/additional controls or actions	Risk Rating (with added controls)
<b>Private property north of Talone Road turnaround including public road (Talone Road), parking areas, fence, trees and cliff face.</b>						
Potential to fall over the cliff edge	Activities close to edge, such as: <ul style="list-style-type: none"> <li>• Sightseeing</li> <li>• Abseiling – unofficial anchor points</li> <li>• Risk taking – e.g. cliff diving</li> <li>• Photography</li> <li>• Mental health</li> <li>• Domestic violence</li> </ul> Poor lighting	<ul style="list-style-type: none"> <li>• Ms Lore's fatality</li> <li>• Multiple Police callouts (see 3.2 in Risk Assessment report)</li> <li>• Access by educational and sporting groups (approx. once per month)</li> <li>• Geotechnical report 1999</li> </ul>	Fencing - inconsistent: <ul style="list-style-type: none"> <li>• one section approx. 1.6m;</li> <li>• one section approx. 1.0m.</li> </ul> Signage - inadequate	Major Unlikely Significant 12	<ul style="list-style-type: none"> <li>• Fencing:               <ul style="list-style-type: none"> <li>- <u>Option 1</u>. Install an appropriate fence to prevent all access (all 3 sides)</li> <li>- <u>Option 2</u>. Install Option 1 fence, with controlled access</li> </ul> </li> <li>• Improve/ Additional signage</li> <li>• Standardised /Certified anchor points</li> <li>• Update geotechnical assessment to determine current stability of area</li> <li>• Develop Controlled access standard / checks</li> <li>• Install lighting for control vs amenity – street and pedestrian (Lighting assessment)</li> <li>• Education Program</li> </ul>	<i>Risk taking person and Person with mental health issues (suicidal)</i> Major Unlikely Significant 12
						<i>Abseiler and inebriated person(s):</i> Major Rare Significant 7
						<i>Reasonable person, child:</i> Low Possible Low 6

Hazard Description	Causes	History, Data, Comments	Existing Controls	Current Risk Rating	New/additional controls or actions	Risk Rating (with added controls)
Potential to fall while climbing the fence	Seeking access to the cliff edge  Fence close to cliff edge	Ms Lore's fatality	Fencing - inconsistent: <ul style="list-style-type: none"> <li>one section approx. 1.6m;</li> <li>one section approx. 1.0m.</li> </ul> Signage - inadequate	Major Possible High 17	<ul style="list-style-type: none"> <li>Relocate fence away from cliff edge</li> <li>Install fence which prevents climbing where sufficient distance cannot be achieved</li> </ul>	Major Unlikely Significant 12
Injury due to unstable cliff face (base of cliff)	Falling rocks  Landslip	Landslip zoning area (Geotechnical Report)	Signage	Major Unlikely Significant 12	<ul style="list-style-type: none"> <li>New geotechnical survey</li> <li>Improve/ Additional signage</li> </ul>	Major Unlikely Significant 12
Injury due to falling tree limbs	Walking underneath/near large trees Weather			Major Unlikely Significant 12	<ul style="list-style-type: none"> <li>Include cliff edge trees in assessment and maintenance schedule for arborists</li> </ul>	Major Unlikely Significant 12
Injury from pedestrian and traffic interaction	Roadway Sightseeing No path		Low speed zone	Moderate Unlikely Moderate 8	<ul style="list-style-type: none"> <li>Planned upgrade to Talone Road which includes designated pathways</li> </ul>	Moderate Rare Moderate 4
Slips / Trips	Weather  Uneven ground			Minor Possible Moderate 9	<ul style="list-style-type: none"> <li>Planned upgrade to Talone Road which includes designated pathways</li> <li>Amenity lighting for pathways</li> </ul>	Minor Unlikely Low 5

Hazard Description	Causes	History, Data, Comments	Existing Controls	Current Risk Rating	New/additional controls or actions	Risk Rating (with added controls)
<b>Blowhole reserve park area including blowhole, seating, fallen trees, path, fence and cliff</b>						
Potential to fall over the cliff edge	Access for abseiling  Sightseeing / Walking		Low level of fence for one section, and no fence in another section	Unlikely Major Significant 12	<ul style="list-style-type: none"> <li>New geotechnical survey</li> <li>See Opt 2 above – Fencing</li> <li>Amenity Lighting</li> </ul>	Rare Major Significant 7
Potential to fall over the blowhole edge	Sightseeing / Walking	Geotechnical Report 1999	Fence - 1.8 m pool type safety fence around the perimeter	Rare Major Significant 7	<ul style="list-style-type: none"> <li>New geotechnical survey</li> </ul>	Rare Major Significant 7
Injury due to unstable cliff face (base of Cliff)	Falling rocks  Landslip	Landslip zoning area (Geotechnical Report)	Signage	Major Unlikely Significant 12	<ul style="list-style-type: none"> <li>New geotechnical survey</li> <li>Improve/ Additional signage</li> </ul>	Major Unlikely Significant 12
Injury due to falling tree limbs	Walking underneath/near large trees  Weather			Major Unlikely Significant 12	<ul style="list-style-type: none"> <li>Include newly acquired area in assessment and maintenance schedule for Arborists</li> </ul>	Major Unlikely Significant 12
Slips / Trips	Weather  Uneven ground/pathways		Paved pathway (uneven steps)	Minor Possible Moderate 9	<ul style="list-style-type: none"> <li>Improve pathway and steps to remove trip hazards</li> <li>Amenity lighting for pathways</li> </ul>	Minor Unlikely Low 5

Hazard Description	Causes	History, Data, Comments	Existing Controls	Current Risk Rating	New/additional controls or actions	Risk Rating (with added controls)
<b>Walking area near street (Blowhole Road)</b>						
Proximity of cars to pedestrians and cyclists	Removal of bollards  1-way access and potential width of heavy vehicles	No recorded incidents between vehicles and pedestrians, but vehicles hitting bollards (potentially deliberate)	3 frangible bollards 40km/h speed zone (actual speed likely 30km/h)	Moderate Unlikely Moderate 8	Redesign road – pedestrian and vehicular interface	Moderate Rare Moderate 4
Slips / Trips - Unofficial path	Access to beach  Physical barrier between vehicles and pedestrian via this route	No recorded incidents		Minor Possible Moderate 9	Install stairway OR Block pathway with dense vegetation	Minor Rare Low 2

## 10.2. Attachment 2: Risk Matrix

CONSEQUENCE TABLE		
CONSEQUENCE	HEALTH & SAFETY	LOSS / DAMAGE
1 Low	First aid treatment	\$0 - \$15k
2 Minor	Medical treatment	\$15k - \$150k
3 Moderate	Classified injury	\$150k - \$500k
4 Major	Fatality or severe permanent disability	\$500k - \$1.5m
5 Catastrophic	Multiple fatalities / health effects to > 50 people	\$1.5m +

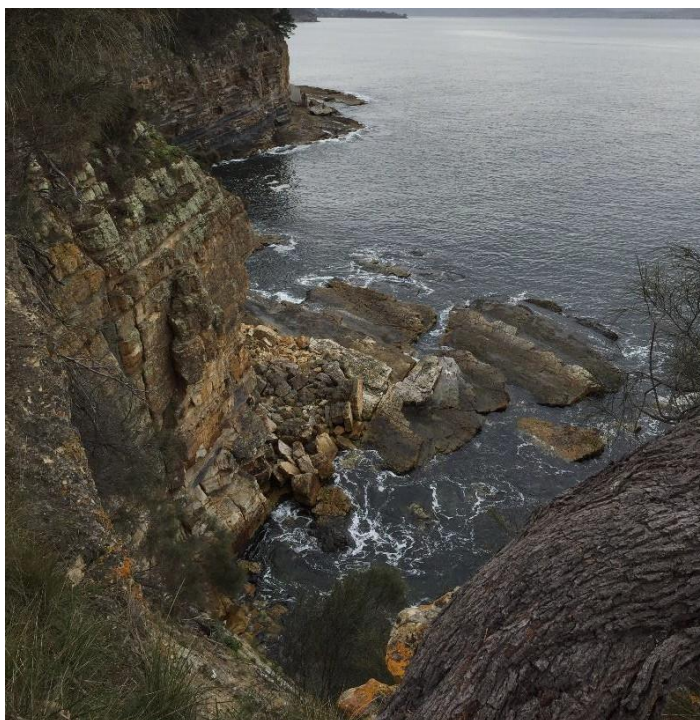
LIKELIHOOD TABLE		
LIKELIHOOD	DESCRIPTION	FREQUENCY
1 Rare	May happen in extreme circumstances	Occurs once a century
2 Unlikely	May happen at some time	Occurs once a decade
3 Possible	May happen	Occurs once a year
4 Likely	May easily happen	Occurs once a month
5 Almost Certain	Expected to happen	Occurs once a week

## RISK LEVEL MATRIX

Likelihood	Consequence				
	Low 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
1 Rare	1 L	2 L	4 M	7 S	11 S
2 Unlikely	3 L	5 L	8 M	12 S	16 H
3 Possible	6 L	9 M	13 S	17 H	20 H
4 Likely	10 M	14 S	18 S	21 H	23 H
5 Almost Certain	15 S	19 S	22 H	24 H	25 H

<b>L = Low</b>	Acceptable risk perhaps, manage by routine procedures
<b>M = Moderate</b>	Attend to in medium term, allocate management responsibility
<b>S = Significant</b>	Stop work, Contact Supervisor
<b>H = High</b>	Immediately stop work, Contact supervisor, Supervisor to notify Management. Detailed research and management planning required at senior levels.

### 10.3. Attachment 3: Photos



*Photo 1: Section of cliff face*



*Photo 2: Two standards of fencing*



*Photo 3: Fence in Blowhole Reserve*



*Photo 4: Blowhole Fence*



*Photo 5: Pathway in Blowhole Reserve*



*Photo 6: Blowhole Road – Pedestrian / vehicle interface*



*Photo 7: Unofficial path from Blowhole Road to beach*

## DOCUMENT DISTRIBUTION LIST

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