Marinus Link Pty Ltd
PO Box 606 Moonah
Tasmania Australia 7009

6 December 2024

Mr Chris Coad
Manager Development Services
Burnie City Council
PO Box 973
Burnie TAS 7320

Application No:	**DA 2022/76**
Council reference:	**SP: CF 2920337 & 9296310**
Land:	**Corner of Minna Road and Bass Highway (18 and 20 Minna Road), Heybridge and 22 Minna Road, Heybridge, Tasmania**
Proposal:	**Heybridge Converter Station, Marinus Link**

Dear Chris

I refer to Burnie City Council's outstanding Requests for Additional Information, dated 28 November 2024, related to permit application (DA 2022/76) for Marinus Link's proposed Converter Station at corner of Bass Highway and Minna Road (18 and 20 Minna Road), Heybridge and 22 Minna Road, Heybridge (DA 2022/76).

As detailed in my letter of 4 December 2024, please find below responses and accompanying attachments to final outstanding matters relating to Sections in 4, 12 and 13.

On behalf of Marinus Link Pty Ltd, I wish to thank you for considering our application. If you have any questions in relation to our responses or require further information, please contact me on 0474 889 130 or at kate.guard@marinuslink.com.au.

Kind regards

K. Guard

Kate Guard
Head of Environment and Planning
Encl.

Marinus Link Pty Ltd
PO Box 606 Moonah
Tasmania Australia 7009

Response to Requests for Additional Information dated 28 November 2024

1 Application Form

Council RFI	Response to RFI
Revised form received, however a full copy of each of the three certificates of titles listed on the application also needs to be provided.	Under assessment. Provided to Council on 4 December 2024

2 Site Plan and Elevation of Buildings

Council RFI	Response to RFI
Information provided	Under assessment. Provided to Council on 4 December 2024

3 Development Application – Heybridge Converter Station

Council RFI	Response to RFI
Information provided	Not required.

4 C20.4.1 – Building Height – P1

Council RFI	Response to RFI
A Landscape and Visual Impact Assessment has been provided. The Assessment does not specifically address the provisions within the Tasmanian Planning Scheme (TPS), clause 20.4.1, P1. The tests within clause 20.4.1, P1 requires that the proposed apex height of 27m for two separate buildings does not cause an unreasonable impact on **adjoining properties**, having regard to the proposed height; the bulk and form of the building; the separation from existing uses on adjoining properties; and any buffers created by natural or other features, in accordance with clause 20.4.1, P1.	Evidence to support achievement of clause 20.4.1, P1 is contained in **Attachment 1.**

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Council RFI	Response to RFI
Adjoining is defined within the TPS 'means next to, or having a common boundary with'. Further, the photo montages do not show the proposed built form when viewed from the adjoining properties. It is noted that the spelling of Bass Strait is incorrect throughout this Assessment and page 37 has two bookmark errors. Further information is required to evidence achievement of clause 20.4.1, P1.	

5 C1.0 Sign Code

Council RFI	Response to RFI
Information provided	Not required.

6 C2.0 Parking and Sustainable Transport Code

Council RFI	Response to RFI
It is noted that there is no minimum requirement for onsite parking for a Utilities use class. However, as onsite parking is proposed can you please provide a parking plan, which details compliance with clauses C2.6.1 and C2.6.2. Information provided in relation to clause C2.6.1 and C2.6.2 is provided against P1. It is a mandatory requirement of the TPS to evidence compliance with these standards. Your application states that compliance will be achieved but does not show how this will be achieved. Further information is required to evidence achievement of clauses C2.6.1 and C2.6.2, this is a mandatory requirement of the TPS.	Under assessment. Provided to Council on 4 December 2024

7 C3.0 Road and Railway Assets Code

Council RFI	Response to RFI

Marinus Link Pty Ltd
PO Box 606 Moonah
Tasmania Australia 7009

It is noted that a Statement of Compliance was issued on 5 December 2024 which is valid for 12 months only. You will need to liaise with Councils Technical Officers in having this reissued for a further 12-month period.	Under assessment. Provided to Council on 4 December 2024

8 C5.0 Telecommunication Code

Council RFI	Response to RFI
Information provided	Not required.

9 C7.0 Natural Assets Code

Council RFI	Response to RFI
Information provided	Not required.

10 C8.0 Scenic Protection Code

Council RFI	Response to RFI
Information provided	Not required.

11 C13.0 Bushfire Prone Areas Code

Council RFI	Response to RFI
Information provided – verbal response from BCC 3 December 2024	Not required

12 C14.0 Potentially Contaminated Land Code

Council RFI	Response to RFI
We acknowledge the information provided against the Code.	Evidence to support achievement of clause C14.6.1 P1 is contained in **Attachment 2**

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Tasmania Australia 7009

Council RFI	Response to RFI
Additional information is requested, as an environmental site assessment is required (as defined within the Code), by a suitability qualified person, to demonstrate achievement of clause C14.6.1, P1. It is noted that a Contaminated Land and Acid Sulfate Soil Impact Assessment has been provided. However, the Assessment does not specifically address the provisions within the Tasmanian Planning Scheme (TPS), clause C14.6.1, P1. Within this Assessment version 8 is dated 13 September **2027,** and page 32 and 33 refer to the site being zoned Rural Living instead of Rural. Further information is required to evidence achievement of clause C14.6.1, P1, this is a mandatory requirement of the TPS.	

13 C15.0 Landslip Hazard Code

Council RFI	Response to RFI
The Code is applicable as there is some low and medium landslide hazard identified on site. However, both the proposed use and development are exempt from the Code in accordance with clause C15.4.1 (a) and (d). It is noted that both cut and fill is proposed over the site. As significant work is proposed, there is no exemption applicable for significant works. The exemption set out in C15.4.1(d) does not apply to significant works as it does not require authorisation under the Building Act 2016. **Significant works triggers assessment under clause C15.6.1, P1.1 and P1.2.** Significant works is only applicable to cut and/or fill within the landslip hazard band. If there is significant works within the mapped landslip hazard band, then a Landslip Hazard Report (as defined under C15.0 Landslip Hazard Code) will be required, by a suitably qualified person to address clause C15.6.1, P1.1 and P1.2.	A Landslip Hazard Report has been prepared by a suitably qualified person addressing clause C15.6.1, P1.1 and P1.2. The Landslide Risk Assessment Report prepared by Tasman Geotechnics, December 2024, is contained in **Attachment 3.**

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PO Box 606 Moonah
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Attachments

1. Letter providing evidence to support building height is contained in **Attachment 1.**.
2. Letter providing evidence to support achievement of Potentially Contaminated Land Code is contained in **Attachment 2.**
3. The Landslide Risk Assessment Report prepared by Tasman Geotechnics, December 2024, is contained in **Attachment 3.**

06 December 2024

Marinus Link Pty Ltd
Attn: Kate Guard
PO Box 606
Moonah
TAS 7009

Application No: DA 2022/76

Council reference: SP: CF 2920337 & 9296310

Land: 18, 20 and 22 Minna Road, Heybridge

Proposal: Heybridge converter station

Dear Kate,

Marinus Link Pty Ltd (MLPL) are proposing to construct a converter station on the property which will convert high-voltage alternating current (AC) electricity from the Tasmanian electrical grid to direct current (DC) which will be transferred to Victoria and the national electricity grid via sub-sea cables.

This letter has been prepared to support a response to Burnie City Council's request for additional information, dated 28 November 2024, in relation to permit application (DA 2022/76) for MLPL's proposed converter station at Bass Highway, Heybridge and 22 Minna Road, Heybridge (DA 2022/76). This letter provides a response to the fourth item in Council's letter i.e. compliance with Clause 20.4.1 of the Tasmanian Planning Scheme.

A Landscape and Visual Impact Assessment (Landform Architects, 2024) was prepared and submitted to Burnie City Council to support the permit application. This letter should be read in conjunction with this report.

1. TASMANIAN PLANNING SCHEME

The proposed converter site is located in a Rural Zone under the Tasmanian Planning Scheme. Clause 20.4 of the Rural Zone relates to development standards for buildings and works. Building height requirements under the zone are set out under Clause 20.4.1 which establishes the following objective within the zone:

To provide for a building height that:

a) *Is necessary for the operation of the use; and*
b) *Minimises adverse impacts on adjoining properties*

The table below (Table 1) sets out the acceptable solutions and performance criteria for development under Clause 20.4.1.

Table 1 Acceptable solutions and performance criteria (TPS Clause 20.4.1)

Acceptable Solutions	Performance Criteria
A1 Building height must be not more than 12m	**P1** Building height must be necessary for the operation of the use and not cause an unreasonable impact on adjoining properties, having regard to: (a) the proposed height of the building; (b) the bulk and form of the building; (c) the separation from existing uses on adjoining properties; and (d) any buffers created by natural or other features.

1.1 THE SUBJECT SITE

The subject site for the development application consists of three parcels which are identified in Figure 1 as T1818, T1999 and T2000 owned by Tasmanian Networks Pty Ltd (TasNetworks) and MLPL respectively.

1.2 ADJOINING PROPERTIES

Under the State Planning Provisions for the Tasmanian Planning Scheme, Table 3.1 includes a definition of 'adjoining' as follows: '*means next to, or having a common boundary with*'. While there is no definition of 'property' in the planning provisions, the Macquarie dictionary relevant definition is: '*a piece of land owned'.*

Therefore the 'adjoining properties' as per Performance Criteria 1 of Clause 20.4.1 are the 12 properties which directly adjoin the subject site.

1.3 ASSESSMENT AGAINST TPS CLAUSE 20.4.1

The table below (Table 2) provides an assessment of the adjoining properties, including their ownership, tenure, land type and land use.

Table 2 Assessment against TPS CLAUSE 20.4.1

No.	Property ID	PID	CID	Land owner/manager	Tenure	Land Type	Land use and assessment
1	T1283	0	1333053	State government	Crown Land	Acquired Road	Vacant roadside vegetation. This property is state owned land adjoining the Bass Highway road reserve. It is heavily vegetated land without public access or sensitive receptors. The converter station buildings would not cause an unreasonable impact on this property.

No.	Property ID	PID	CID	Land owner/manager	Tenure	Land Type	Land use and assessment
2	T1287	0	1357936	MLPL	Freehold Title	Subdivision Road	Vacant roadside vegetation. This property is privately owned by MLPL It is a strip of vegetated land between the subject site and the road reserve. This subdivisional road is likely to have been created to legally prevent direct access to Bass Highway. Due to its minimal width, it cannot be used for other purposes. Given its purpose, minimal width, vegetation and limited access the converter station buildings would not cause an unreasonable impact on this property.
3	T1284	0	527621	MLPL	Freehold Title	Private Parcel	Vacant roadside vegetation. This property is privately owned by MLPL. It is a strip of vegetated land between the subject site and the Bass Highway road reserve and adjoining the Minna Road intersection. Due to its minimal width, it cannot be used for other purposes. Given its minimal width, the vegetation on this land and limited access the converter station buildings would not cause an unreasonable impact on this property.
4	T1281	0	527630	MLPL	Freehold Title	Private Parcel	Vacant roadside vegetation. This property is privately owned by MLPL. It is a strip of vegetated land between the subject site and Minna Road, in close proximity to the Bass Highway intersection. Due to its minimal width, it cannot be used for other purposes. Given its minimal width, the vegetation on this land and limited access the converter station buildings would not cause an unreasonable impact on this property.

No.	Property ID	PID	CID	Land owner/manager	Tenure	Land Type	Land use and assessment
5	T0571	0	1357938	MLPL	Freehold Title	Subdivision Road	Vacant roadside vegetation. This property is privately owned by MLPL. It is a strip of land along the entrance to the subject site adjoining the Minna Road reserve. The land consists of a vegetated rock escarpment and part of the paved entrance to the site. The subject site is not visible from the publicly accessible part of this property i.e. the Minna Road reserve. Therefore, the converter station buildings would not cause an unreasonable impact on this property.
6	T0574	0	1333050	Council	Crown Land	Acquired Road	Minna Road – local government road. This property is the Minna Road reserve. It is Crown land managed by Council. The subject site is not visible from the majority of Minna Road due to a combination of rock escarpments and a heavily vegetated boundary. The only with the exception of the access point which would provide a fleeting view for motorists. Minna Road has no footpaths and would have minimal pedestrian use. Given the limited visibility and low sensitivity of Minna Road, the converter station buildings would not cause an unreasonable impact on this property.

No.	Property ID	PID	CID	Land owner/manager	Tenure	Land Type	Land use and assessment
7	T0570	0	527628	Council	Crown Land	Reserved Road	Minna Road – local government road and roadside vegetation. This property is the Minna Road reserve. It is Crown land managed by Council. The subject site is not visible from the majority of Minna Road due to a combination of rock escarpments and a heavily vegetated boundary. The only with the exception of the access point which would provide a fleeting view for motorists. Minna Road has no footpaths and would have minimal pedestrian use. Given the limited visibility and low sensitivity of Minna Road, the converter station buildings would not cause an unreasonable impact on this property.
8	T0548	0	1388578	Private	Freehold Title	Private Parcel	Vegetation surrounding housing development. This property is private land associated with a residential development to the northwest of the subject site. The bushland area that is not suitable for development or access due to its steep natural incline, partial rock escarpment and being heavily vegetated. The subject site is also not visible from Devonshire Drive, the residential street adjoining this property at the top of the escarpment. Considering the nature of this steep, in accessible bushland escarpment, the converter station buildings would not cause an unreasonable impact on this property.

No.	Property ID	PID	CID	Land owner/manager	Tenure	Land Type	Land use and assessment
9	T1820	9360450	1531414	Private	Freehold Title	Private Parcel	Vegetation with some cleared areas. This property is privately owned and is proposed to be used for a refuse waste station. The majority of the land is heavily vegetated. Part of the land is cleared in preparation for the refuse waste station. Therefore, the land is used for commercial purposes and has low sensitivity and there would be no public view from the property to the subject site. The land is also planned to be used for high voltage transmission lines that will connect to the Heybridge converter station. Therefore, the converter buildings would not cause and unreasonable impact on this property.
10	T0567	0	1419154	Crown	Crown Land	Road	Minna Road – local government road and roadside vegetation. This property is part of the Minna Road reserve. It is Crown land managed by Council. The subject site is not visible from the majority of Minna Road due to a combination of rock escarpments and a heavily vegetated boundary. Minna Road has no footpaths and would have minimal pedestrian use. Given the limited visibility and low sensitivity of Minna Road, the converter station buildings would not cause an unreasonable impact on this property.

No.	Property ID	PID	CID	Land owner/manager	Tenure	Land Type	Land use and assessment
11	T0569	0	1086696	Council	Crown Land	Reserved Road	Minna Road – local government road and roadside vegetation. This property is part of the Minna Road reserve. It is Crown land managed by Council. The subject site is not visible from the majority of Minna Road due to a combination of rock escarpments and a heavily vegetated boundary. The only with the exception of the access point which would provide a fleeting view for motorists. Minna Road has no footpaths and would have minimal pedestrian use. Given the limited visibility and low sensitivity of Minna Road, the converter station buildings would not cause an unreasonable impact on this property.
12	T0579	0	1489671	State government	Crown Land	Road	Bass Highway – state government road. This property is the Bass Highway road reserve. It is a duplicated state government road with a dual carriageway and centre median. The road has a 90km speed limit, with a narrow road reserve, with no footpaths and road safety barriers and utility poles between the road and the subject site. There is no access to the site from Bass Highway. Directly to the northeast of Bass Highway is a rail reserve (Western Line railway) and associated rail crossing. This is a high speed road that is unsafe for pedestrian access. While the converter station buildings would be partly screened by roadside vegetation there would be fleeting views where the buildings would be highly visible. Bass Highway would have a low sensitivity as a high-speed state road and while visible to passing motorists this view would be fleeting. Therefore, the converter station buildings would not cause and unreasonable impact on this property.

The table below (Table 3) summarises the outcome of the compliance assessment against Clause 20.4.1 of the Tasmanian Planning Scheme.

Table 3 Summary of compliance assessment of the proposed converter site against TPS Clause 20.4.1

Performance Criteria	Assessment Outcome
P1 Building height must be necessary for the operation of the use and not cause an unreasonable impact on adjoining properties, having regard to: (a) the proposed height of the building; (b) the bulk and form of the building; (c) the separation from existing uses on adjoining properties; and (d) any buffers created by natural or other features.	The converter station building design, including their height, bulk and form has been informed by the design of the necessary equipment needed for the conversion of HVDC electricity to HVAC electricity and vice versa. The development is within a Utilities use class and as per P1 this building height is necessary for the operation of the use. Table 2 assesses the potential impact of the proposed buildings based on their height of 27 m and proposed bulk and form when viewed from each of the 10 adjoining properties. This assessment outlines the existing uses of each of the properties and any buffers created by natural or other features. The assessment of each adjoining property concludes that the proposed building height would not cause unreasonable impact on adjoining properties. Five of these properties are public roads, Bass Highway and Minna Road which are owned by the state government and Council respectively. While there would be fleeting views from Bass Highway the view is partly screened and of low sensitivity. Five properties are directly adjoining theses public roads and are effectively extensions of the public road reserves. They are vegetated, screening views to the subject site. The remaining three properties are a privately owned area of steep, vegetated bushland along and escarpment to the northwest that is not accessed by the public and land owned by TasNetworks is association with the subject site that is proposed to be used for high voltage transmission lines connecting to the converter station.

2. CONCLUSION

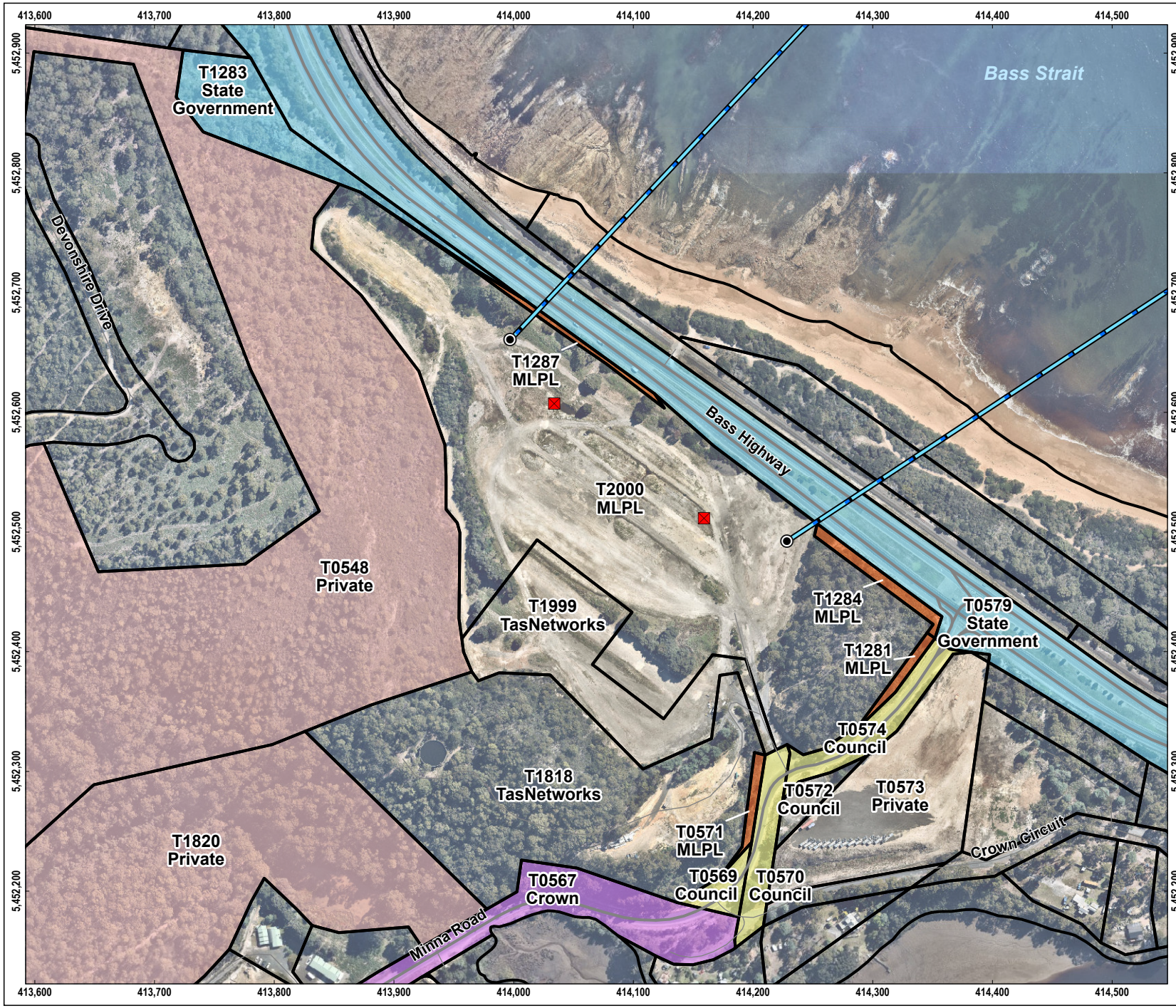
This letter has assessed the against the performance criteria of Clause 20.4.1 of the Tasmanian Planning Scheme. In accordance with clause, the proposed converter station building heights, bulk and form are necessary to enable the operation of the use, and to contain all necessary equipment.

An assessment of each of the properties adjoining the subject site confirms that the proposed building height would not cause unreasonable impact to those properties given their uses, vegetated nature, natural screening and buffers and their limited visibility of the subject site and sensitivity (limited sensitive receptors). It is for these reasons that photomontages are not warranted from adjoining properties.

Therefore, the proposal is considered to be compliant with the requirements of Clause 20.4.1 of the Tasmanian Planning Scheme.

Regards,

Noel Treacy
Principal Urban Planner
Tetra Tech Coffey



MARINUS LINK

LEGEND

- Landfall
- Converter station
- HVDC subsea cable
- Major road
- Minor road
- Cadastre

Adjoining property as defined by the Tasmanian Planning Scheme

- Marinus Link (MLPL)
- Private
- State Government
- Crown
- Council

SOURCE
Proposed route from Tetra Tech Coffey.
Roads, watercourse and cadastre from DPIPWE.
Imagery from Nearmap (24/02/2024).

0 50 100 m

SCALE **1:4,500**
PAGE SIZE: **A4**
PROJECTION: **GDA2020 MGA Zone 55**

MARINUS LINK PTY LTD

MARINUS LINK

FIGURE 1

Adjoining properties to the Marinus Link Heybridge converter station

TETRA TECH COFFEY

DATE: 05.12.24 PROJECT: 754-MELEN215878ML FILE:215878ML_R16A_F001_GIS

DOC REFERENCE: \\TT-LOCAL\COP-S772\SIG\SIG215878_MELEN_TASNETWORKS_PROJECT\MARINUS\TASNETWORKS PROJECT\MARINUS\SIG\MXD_A\PRX\215878ML_R16\215878ML_R16A_FIGS_A.APRX LAYOUT\215878ML_R16A_F001_GIS_3 SAVED BY: HELEN.JUNKOVICH 05.12.24 4:42 PM

TETRA TECH COFFEY

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6 December 2024

Our ref: 754-MELEN215878ML-CSASS_Tas_L01

Marinus Link Pty Ltd
1/7 Maria Street
Lenah Valley
TAS 7008

Attention: Kate Guard

Dear Kate,

Proposed Heybridge Converter Station Site - Tasmanian Planning Scheme Contamination Considerations

1. INTRODUCTION

Tetra Tech Coffey Pty Ltd (Tetra Tech Coffey) was engaged by Marinus Link Pty Ltd (MLPL) to undertake a contamination and acid sulfate soil investigation of the proposed Heybridge Converter Station Site, located on part of 18-20 Minna Road, Heybridge.

MLPL are proposing to construct a converter station on the property which will convert high voltage alternating current (AC) electricity from the Tasmanian electrical grid to direct current (DC) which will be transferred to Victoria and the national electricity grid via sub-sea cables.

As a part of the proposed construction, excavation of soils to construct footings for the various infrastructure, as well as the installation of horizontal directionally drilled cable conduits, at the shore crossing, will occur.

This letter presents a summary of the assessment of the Heybridge Converter Station Site against the requirements of the Tasmanian Planning Scheme (TPS) Clause 14.6.

This assessment has been undertaken as a part of the *Marinus Link Contaminated Land and Acid Sulfate Soils Impact Assessment – Heybridge Converter Station, Tasmania* report (the 'environmental impact assessment') prepared for the Heybridge Converter Station Site for MLPL (Tetra Tech Coffey, 2024). This letter should be read in conjunction with the aforesaid report and the attached limitations.

2. TASMANIAN PLANNING SCHEME

The TPS Clause 14.6 *Development Standards for Building and Works* details the requirements for proponents planning to undertake excavations on potentially contaminated land.

The Objective of the clause is to ensure that *works involving excavation of potentially contaminated land do not adversely impact on human health or the environment*.

The clause sets Acceptable Solutions and / or Performance Criteria which must be complied with to meet the objective depending on the proposed volume of soil to be removed (as listed in the table below).

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

3. ASSESSMENT AGAINST TPS CLAUSE 14.6

Based on the site history and detailed site investigation undertaken outlined in the Environmental Impact Assessment Report (Tetra Tech Coffey 2024), for the site, potential sources of contamination and activities have occurred at the Heybridge Converter Station Site.

The site history identified that the site was a former factory that manufactured titanium oxide for use in paints, which closed in the late 1990s.

Consequently, the site is considered to be **potentially contaminated land** under the definitions included in TPS Clause 14.7, Table 14.2 as the site was used for *Mineral Processing* and/or *Industrial activities involving hazardous chemicals in significant quantities.*

The factory was decommissioned, and the site remediated in accordance with a Tasmanian EPA endorsed remediation plan. Validation sampling was undertaken as a part of the remediation activities. Further soil sampling was undertaken subsequent to the remediation of the site to inform the current status of the site. All analytical results were below human health screening criteria for the site (suitable for commercial/industrial uses), with selected soils containing concentrations of some metals above ecological screening criteria. Potentially acid sulfate soils have also been identified on the site, as well as minor areas with asbestos containing materials (ACM), which were removed where observed.

The **Acceptable Solution A1** is not able to be applied as the site will disturb more than 250 m^3 of soils. As a result, the proposed development has been assessed against the **Performance Criteria P1**. The performance criteria have been assessed individually in the table below.

Performance Criteria	Assessment Outcome
Excavation must not have an adverse impact on human health or the environment, having regard to:	
(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated;	Not Applicable The environmental impact assessment undertaken at the site did identify minor areas where soil contamination exceeded the adopted ecological screening criteria from the NEPM for Commercial/Industrial land uses.

Performance Criteria	Assessment Outcome
(b) an environmental site assessment that demonstrates that the level of contamination does not present a risk to human health or the environment; or	Not applicable The environmental assessment identified one location with a concentration of zinc in excess of the NEPM Ecological Investigation Levels (EILs) adopted for the proposed commercial/industrial land use for the site. The environmental impact assessment also identified ACM were incorporated into the fill soils at several locations. Whilst the observed ACM was removed during that investigation, there is a potential that other fragments of ACM are present in soils at the site. As a conservative measure, the environmental impact assessment considered that there was a potential that ACM and/or other contamination may be on the site that (if disturbed) may potentially present a risk to human health or the environment.
(c) an environmental site assessment, including a plan to manage contamination and associated risk to human health and the environment, that includes: (i) any specific remediation and protection measures required to be implemented before excavation commences; and (ii) a statement that the excavation does not adversely impact on human health or the environment.	Applicable The environmental impact assessment includes management and mitigation measures (refer to Section 10 of the report) to address any potential risks to human health or ecological receptors that may arise during the redevelopment of the site for the proposed converter station site. The management and mitigation measures are documented in the environmental impact assessment report and include specific measures to be undertaken prior to excavation commencing.

The environmental impact assessment demonstrates that the proposal complies with performance criteria (c)(i) and (ii) of Clause 14.6.

In my opinion, the proposed management and mitigation measures (as detailed in Section 10 of the Environmental Impact Assessment report – Tetra Tech Coffey, 2024) are suitable to appropriately and adequately manage risks associated with any potential contamination. Consequently, the management controls will reduce the potential for adverse impacts on human health or the environment where excavation activities are proposed to be undertaken on the site as a part of the redevelopment

4. CLOSURE

Should you have any queries regarding this letter, or the contents of the Environmental Impact Assessment Report please contact the undersigned.

Regards

Bryden Tiddy
Principal Environmental Scientist

Attachment – Statement of Limitations

LANDSLIDE RISK ASSESSMENT
PROPOSED CONVERTER STATION
BASS HIGHWAY, HEYBRIDGE

Prepared for: **Marinus Link**

Date: 4 December 2024

Document Reference: TG24218/1 - 02report

Tasman Geotechnics Pty Ltd ABN 96 130 022 589
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Contents

Figures

Appendices

Version	Date	Prepared by	Reviewed by	Distribution
Original	4 December 2024	Nevil Vanderslink	Dr Wayne Griffioen	Electronic

1 INTRODUCTION

Tasman Geotechnics was commissioned by Marinus Link to carry out a Landslide Risk Assessment at the site of a proposed converter station at Heybridge in North-west Tasmania.

An interconnector between Tasmania and Victoria, known as Marinus Link, is proposed to provide a second High Voltage Direct Current (HVDC) link between the existing High Voltage Alternating Current (HVAC) Tasmanian and Victorian electricity grids enabling energy transfer between these regions in the National Electricity Market (NEM).

To support the development of Marinus Link and likely future demand from increased renewables production in the state, augmentation of and upgrades to the existing transmission network in Tasmania are planned and this includes construction of a new converter station and associated infrastructure at the Heybridge site.

The proposed development site is located on the southern side of Bass Highway, at 18 - 20 Minna Road, Heybridge (title reference 184295/1 & 184295/2). The site has previously been used for industrial activities and is presently vacant.

The assessment is required as part of the Planning Application process as parts of the site are mapped within 'Low' and 'Medium' hazard bands on the Landslide Planning Map V2 – Hazard Bands overlay on The LIST. Thus, the proposed development requires a landslip hazard report prepared by a Geotechnical Practitioner under Section C15.0 – Landslip Hazard Code of the Tasmanian Planning Scheme.

The proposed development will include cut and fill earthworks to create level areas. The proposed cut and fill depths are yet to be finalised; however, they are expected to be up to about 2.5m vertically in each case and some of the earthworks extend into the mapped landslide hazard areas.

It is our understanding that the proposed development will be constructed in two stages. In terms of the landslide hazard areas, Stage 1 will include earthworks and the construction of Converter Station 1 and associated AC switching building. Stage 2 will involve construction of Converter Station 2 and associated AC switching building. This building is located partly in the landslide hazard band.

A site plan showing the location of the proposed development was provided by the client.

Our scope of work consisted of:

- Reviewing available reports and maps.
- Identifying likely subsurface conditions at the site based on previous geotechnical investigations.
- Conducting a Landslide Risk Assessment.

2 DATA SOURCES

The information presented in this report was obtained from various sources:

- Mineral Resources Tasmania (MRT) geology and landslide hazard maps,
- Aerial photographs from The LIST,
- Environmental Site Assessment report (Cromer, 2007) which also references earlier investigations at the site, particularly test pits from a 2004 investigation which provide valuable information on subsurface conditions at the site (report reference *Site Contamination Assessment Former Tioxide Factory Site*, dated 6 June 2007),
- A Geotechnical Overview report completed by Tasman Geotechnics in August 2020, summarising the findings from a desktop review of available data and a site walkover of the site (report reference TG20137/1 – 01report, dated 13 August 2020),

- A Ground Conditions Factual report completed by Jacobs in April 2022, presenting the findings from a subsurface investigation at the site (report reference IS360318-SO18-CG-RPT-0006, Revision B, dated 29 April 2022),
- A Geotechnical Interpretive Report completed by Jacobs in August 2022, aiming to provide an interpretation of the factual findings reported in the Ground Conditions Factual report (report reference IS360318-SO18-CG-RPT-0007, Revision 0, dated 20 August 2022),
- A Geotechnical Investigation report completed by Tasman Geotechnics in November 2024 for two proposed Horizontal Directional Drilling (HDD) launch shafts and alignments at the site (report reference TG24218/1 – 01report, dated 12 November 2024).

3 BACKGROUND INFORMATION

3.1 Planning Scheme

The Tasmanian Planning Scheme is effective in the Burnie City Council municipal area since 22 July 2020. Clause C15.6.1 of the scheme stipulates that the objective for building and works within a landslip hazard area is:

> *"That building and works on land within a landslip hazard area can:*
>
> *(a) minimise the likelihood of triggering a landslip event; and*
>
> *(b) achieve and maintain a tolerable risk from a landslip."*

There are no acceptable solutions.

The performance criteria state that:

> *P1.1*
>
> *Building and works within a landslip hazard area must minimise the likelihood of triggering a landslip event and achieve and maintain a tolerable risk from landslip, having regard to:*
>
> *(a) the type, form, scale and intended duration of the development;*
>
> *(b) whether any increase in the level of risk from a landslip requires any specific hazard reduction or protection measures;*
>
> *(c) any advice from a State authority, regulated entity or a council; and*
>
> *(d) the advice contained in a landslip hazard report.*
>
> *P1.2*
>
> *A landslip hazard report also demonstrates that the buildings and works do not cause or contribute to landslip on the site, on adjacent land or public infrastructure.*
>
> *P1.3*
>
> *If landslip reduction or protection measures are required beyond the boundary of the site the consent in writing of the owner of that land must be provided for that land to be managed in accordance with the specific hazard reduction or protection measures.*

A risk assessment is to address risk to property and risk to life.

Although tolerable levels of risk for property loss are rarely quoted in literature, using the qualitative risk to property criteria in AGS (2007d) a Moderate risk profile would be considered as a tolerable level of risk for new development on existing slopes as well as existing landslides.

AGS (2007c) suggests the tolerable loss of life individual risk should be 10^{-5}/annum for new constructed slopes, new development, or existing landslide, and 10^{-4}/annum for existing slopes or existing development.

For the proposed works, the following tolerable levels of risk are adopted;

- Risk to property: Moderate,
- Risk to life: 10^{-5}/annum.

3.2 Regional Setting

The proposed converter station site is located at the old Heybridge Tioxide (pigment) plant site about 8km to the east of the coastal township of Burnie, in Northwest Tasmania.

The site is located on a relatively flat coastal plain, at an elevation of between 5m and 10m AHD. A relatively steep escarpment is located directly to the south and west of the site and rises to a maximum elevation of about 135m AHD.

The Bass Highway runs along the northern boundary of the site and Bass Strait is located on the northern side of the highway. The Blythe River is located about 200m to the southeast of the site and drains in a northerly to north-easterly direction into Bass Strait. Blythe Heads is located at the mouth of the river, about 400m to the east of the site.

3.3 Geology

The regional surface geology is taken from the Mineral Resources Tasmania (MRT), Digital Geological Atlas 1:25,000 Series, Burnie Sheet which shows that the surface geology of most of the site is mapped as Quaternary aged sediments described as "*Older stabilised aeolian sand of predominantly coastal plain, with underlying marine sands in places…*".

The surface deposits on the foreshore to the northeast of the site (i.e., northeast of the Bass Highway) are also Quaternary aged and are described as "*Younger active dune, beach sand and beach gravel*". Separating the older stabilised sands of the coastal plain from the younger dunes is an intermediate unit described as "*Sand of stabilised longitudinal beach ridges".* This intermediate unit is mapped on a small portion of the site, on the northern side adjacent to the highway.

The basement geology underlying the younger surficial sands consists of Neoproterozoic-aged sedimentary rocks, described as "*Undifferentiated Oonah Formation, dominantly quartzwacke turbidites*". This unit at this locality has historically been referred to as the Burnie Formation (e.g., by Spry, 1957 and MRT, 2018), and was considered a correlate of the Oonah Formation, but it is now considered part of the Oonah Formation (Geoscience Australia, 2024). The Oonah Formation rocks are mapped along the southwestern margin of the site where the slopes begin to rise towards the southwest, and along the eastern edge of the site adjacent to Minna Road. The Oonah Formation rocks form the escarpment to the west and south of the site.

The Oonah Formation rocks are also sporadically exposed along the shoreline of the beach to the north of the site, and at this location are intruded by several mafic bodies. These are described in the published mapping as *"mafic vesiculate lavas*" but at this locality are more correctly described as dolerites. The mafic bodies are correlates of the 'Cooee Dolerite' and are approximately contemporaneous with the enclosing sedimentary rocks (Gee, 1977 and Spry, 1957 & 1962). Whilst recognised on the exposed foreshore, no mafic intrusive (or extrusive) rocks are mapped within the Oonah Formation rocks south of the highway. This is more likely related to a relative lack of exposure than a complete absence of the mafic rocks.

An extract of the MRT geology map is provided in Figure 1.

3.4 Landslide Mapping

3.4.1 Landslide Inventory

MRT maintains a landslide inventory focused primarily on urban areas of Tasmania, but which also includes known landslides statewide. There are no known landslides at the site. The nearest mapped landslides are located about 1.5km to the west and 2.1km to the southeast of the site respectively and are in unrelated geomorphic settings.

3.4.2 Landslide Susceptibility

In 2004, MRT published the *"Tasmanian Landslide Hazard Series"* maps which includes the site. Three groups of landslide hazards have been identified for northwestern Tasmania:

- Deep seated landslides, predominantly in soils related to Cenozoic basalts but also related to Permian aged sedimentary rocks,
- Shallow slides and debris flows, predominantly in soils associated with Cambrian and/or Cenozoic aged basalts and/or Cenozoic aged sediments, and
- Rock fall (all rock types).

Geological units older than Permian (i.e., including the Neoproterozoic basement at the site) were not modelled for Deep-Seated landslide susceptibility by MRT. Similarly, the Neoproterozoic rocks at the site were not modelled for Shallow Slide & Debris Flow susceptibility. This is not necessarily to imply that such landslides cannot or will not occur in these units, but it does reflect the lower known incidence of such events. Accordingly, there is no mapped susceptibility to these landslide types at the site shown on the published mapping.

3.4.3 Rockfall Susceptibility

In addition to landslides, MRT have also developed susceptibility maps for rockfalls. Two types of processes were included by MRT: rock fall in the strict sense of the word, and topples. Source areas were based on the angle of repose for dolerite talus (42°) and the runout paths were modelled assuming a travel angle between 30° and 34°.

Areas potentially susceptible to rockfall are mapped on the steep escarpment slopes generally to the west of the site, but also in a small area on the east. The 'medium' landslide hazard bands relate to source and runout areas with slopes >34°, and the 'low' hazard bands to runout areas >30°. Areas with flatter slopes are not mapped as susceptible to rockfall.

Figure 2 shows an extract of the MRT landslide hazard map. This shows that the source areas for rockfall (i.e., the medium hazard bands) are generally west of the site, and the slightly flatter runout areas (i.e., the low hazard bands) extend generally short distances onto parts of the site.

3.5 Historical Use

Development at the site commenced in the 1940's with construction of the Tioxide plant. The layout of the plant in 1969 is shown in Figure 3.

Also shown in Figure 3 is the original alignment of the Bass Highway. A railway siding entered the site from the west through a tunnel and operated during the time the plant was on site. Effluent from the site was pumped through a pipe into Bass Strait. The pipe ran through an effluent tunnel as shown in Figure 3.

The Tioxide plant was operated by Tioxide Australia Pty Ltd between 1948 and 1996 after which the plant was demolished. The site was cleared and cleaned up between 1997 and 1998 and validated for use as an industrial/commercial site.

We understand that the effluent tunnel was collapsed during remediation work on the site and a geotechnical report was prepared to document that it is safe to build over the top of the former location of the tunnel. The railway tunnel is still present.

Post-remediation and validation work, the site was used for timber log storage (c. 2013 - 2020). However, the site is not currently in use.

While there is currently no evidence of buildings and structures at the site, there may be concrete footings buried below the current ground level. Previous subsurface investigations at the site (e.g. Cromer, 2007) have encountered fill material overlying the natural soil and rock. Foreign objects, or “cultural artefacts” occur within the fill, these being concrete (blocks, footings, slabs), bricks and brick fragments, pipework (metal, PVC, clay), steel and iron (reinforcing, scrap), electrical wiring, plastic sheeting, timber and process wastes including cinders, ash, minor sludge and ilmenite.

During remediation works after the demolition of the Tioxide plant we understand brown basaltic soil was brought in from the Stowport area and spread over the surface of the site. This soil layer was only thin and only remnants of the basaltic soil remain at the site.

3.6 Proposed Development

The proposed development involves the construction of a converter station and associated infrastructure including transformers, switching stations, control rooms, switch rooms, site offices, construction laydown areas, internal access roads and pavements.

Two HDD launch shafts will also be constructed in northwest and northeast parts of the site to facilitate the installation of the subsea HVDC cables from the site into the Bass Strait.

The development also involves proposed cut earthworks of up to about 3m vertically within the mapped landslide hazard area near the western boundary of the site. This is entirely within the area of a low bench (see following sections) and not into the steep escarpment slopes to the west.

Fill of up to about 2.5m depth/height above existing ground levels is also proposed across the site to create a level design platform for the converter station site.

A site layout map showing the location of the proposed development is presented in Figure 4.

4 RESULTS

4.1 Surface Conditions

The circa 10.4ha site is located approximately 8km to the east of Burnie. The Bass Highway is located directly the north of the site and runs parallel with the northeastern boundary fence. Bass Strait is located on the northeastern side of the highway, about 100m from the site. The site is accessed from Minna Road via a locked gate to the east of the site.

Much of the southern and western boundary of the site is coincident with the toe of the steep escarpment to the west and south, i.e., the escarpment slopes are not on the site itself but are on adjacent sites (e.g., title references 160924/1 and 177416/3). The escarpment is relatively steeply sloping, with a typical fall varying from 25° to 40° towards the northeast. The escarpment is covered with dense shrubs and undergrowth.

Most of the site has little relief and has been graded so that surface water runs off to drainage lines, including a culvert which directs stormwater under Bass Highway and discharges to the beach to the north. The site appears to be well drained in general.

Around the western and southern parts of the site is a low bench at the base of the escarpment, typically 2 – 3m higher than the remainder of the site. The bench width varies but is up to about 20m wide. Examination of the former Tioxide plant layout indicates that the bench appears to be just ‘outside’ of the former plant footprint, i.e., we infer that the plant site was probably lowered by excavation and the bench is principally a remnant of that earlier excavation.

The surface of the site is either vegetated with grasses and sparse shrubs/trees or is bare of vegetation and consists of fill materials predominantly consisting of sands and gravels or asphalt, which are likely old access roads or road base materials. Foreign objects, or “cultural artefacts” are scattered across the site including concrete fragments, bricks, pipework (metal, PVC, clay), steel and iron, electrical wiring, plastic sheeting, and timber. The fill materials are remnants from the old Tioxide plant.

Selected site photographs are presented in Appendix A.

4.2 Subsurface Conditions

Several subsurface investigations have been completed at the site for geotechnical and environmental contamination assessment purposes. The investigations involved borehole drilling and/or test pit excavations, as well as additional testing such as Dynamic Cone Penetrometer (DCP) testing, Standard Penetration Testing (SPT), electrical resistivity testing, thermal resistivity testing and geophysical surveys.

The investigation details are summarised in Table 1 and the borehole and test pit locations are shown in Figure 4. The Cromer (2000 and 2007) boreholes and test pits are not included as the coordinates were either not available or they only sampled near-surface materials.

The subsurface conditions encountered at the site consists of fill (variable thickness but generally thin), overlying natural colluvial, aeolian and/or residual soil deposits, overlying bedrock.

The FILL appears to be thinnest in the western part of the site, typically ranging between 0.15m and 0.3m in thickness and extending to between 1.0 m to 1.3m below ground level within the centre section of the site, and 0.8m to 1.5m in the eastern part of the site.

The FILL consists of various soil types including fine to coarse grained (sandy, silty or clayey) gravels, (gravelly) silts, and medium to high plasticity (sandy) clays. Foreign objects, or “cultural artefacts” occur within the fill, these being concrete (blocks, footings, floors), bricks and brick fragments, pipework (metal, PVC, clay), steel and iron (reinforcing, scrap), electrical wiring, plastic sheeting, timber and process wastes including cinders, ash, minor sludge and ilmenite.

Colluvial deposits have been identified in the north-western part of the site only, which is situated towards the base of the escarpment and reflects their mode of deposition (mixed material that accumulates on slopes and around the slope base). The colluvium typically consists of fine to coarse grained (sandy/silty) gravels, derived from weathering and erosion of the sedimentary basement rocks (sandstone and siltstone) from the escarpment.

On the foreshore to the north of the proposed converter station site, the subsurface conditions consist of up to 3.9m of Quaternary-aged sands directly overlying the bedrock.

The bedrock encountered at the site consists of interbedded (quartzwacke) sandstone and siltstone, with lesser mafic intrusives (principally known from the foreshore exposures). Jacobs (2022) noted that an objective of their investigation was to verify the presence (or absence) of: *basalt – a hard rock geology potentially within the central portion of the site that could impact foundation construction*, i.e., referring to the mafic rocks. Whilst no mafic rocks were found, Jacobs noted: *Whilst evidence of the basalt lava dyke beneath the site was not observed from the exploratory holes carried out, this does not mean that the basalt is not present and therefore this remains a risk for the site*. Recent drilling by Tasman Geotechnics encountered thick zones of dolerite within the Oonah Formation in BH2 at the proposed HDD entry point at the western end of the site, but not in BH1 at the eastern end.

While the Distinctly Weathered to Fresh sandstone and siltstone typically ranges from High to Very High strength and Medium to High strength respectively, the sequence exhibits abundant fractures both as joints and as partings on bedding planes, likely reducing the overall strength of the rock mass. Rock Quality Designation (RQD) values in the sandstone/siltstone typically range from 0% to about 60%, with some higher values in the fresher rock. The dip of the bedding planes varies downhole, typically dipping moderately between 30° and 55°, but steepening to up to about 70° in BH2. The boreholes could not be orientated due to being vertical, so dip direction could not be ascertained. However, based on observations of the rock exposures on the shoreline to the north of the site, the stratigraphy is inferred to have an overall dip towards the northwest at the site.

The rock strength of the dolerite intrusions encountered varies from Very Low strength (Extremely Weathered), Low to Medium strength (Distinctly Weathered) and High to Very High strength (Fresh). The dolerite is generally more competent than the interbedded sandstone/siltstone, and RQD values typically range from 45% to 100%.

Table 1. Subsurface Investigation Summary

Company and Date	Number of Boreholes	Borehole Depth (m BGL)	Number of Test Pits	Test Pit Depth (m BGL)	Fill Thickness (m)	Natural Soil Thickness (m)	Depth to Bedrock (m BGL)	Groundwater Inflow Depth (m BGL)	Purpose	Report Reference
Cromer (2000)	3	10-12	-	-	0.04	-	0.04	1-5	Soil and groundwater contamination assessment following leak in effluent tunnel	Site Contamination Assessment Former Tioxide Factory Site
Cromer (2004)	-	-	13	0.5-3	0.2-1.3	0.05-1.3	0.2-3	1.6-2.8	Soil and groundwater contamination assessment for Tioxide plant site remediation	
Cromer (2007)	-	-	62	0.5-1.8	0.2-1.2	0.1-1.35	0.5-1.5	1-1.3	Soil and groundwater contamination assessment for validation of Tioxide plant site remediation,	
Jacobs (2022)	8	8.5-30	9	1.1-3	0.15-1.4	0.5-2.75	1.4-3.9	0.7-3.1	Geotechnical, hydrogeological and contaminated land assessment for proposed converter station	IS360318-SO18-CG-RPT-0006, Rev B
Tasman Geotechnics (2024)	4	2.7-51	-	-	0.9-1.5	0.4-3.9	1.3-3.9	1-3	Geotechnical Investigation for proposed HDD launch shafts and alignments	TG24218/1 – 01report

The orientation of the dolerite intrusions could not be ascertained from the available data; however, based on observations of the dolerite exposures on the shoreline to the north of the site, they appear to be concordant with bedding (sills).

Groundwater was encountered at the site at relatively shallow depths, ranging from about 0.7m to 3m below ground level, but generally observed at about 1m below ground level.

In terms of the bench around the western and southern parts of the site, investigations have been relatively limited. Three test pits were excavated on the bench by Cromer (2007). These encountered 0.2 – 1.0m of FILL, overlying natural soils (mostly gravel) to 2.3 – 3.0m below ground level in two cases, and in-situ rock in the third case. Therefore, whilst the bench does contain some fill, the full height of the bench (2 – 3m) is not fill, and hence the bench probably does reflect older cut earthworks. Jacobs test pit HB-TP05-C was excavated just below the bench and encountered FILL to 0.8m below ground level, overlying in-situ Extremely Weathered rock.

No intrusive investigations have been carried out on the steep escarpment to the south and west of the site. Nevertheless, an outcrop of Neoproterozoic rock was observed in the top half of the escarpment, suggesting soil cover on the escarpment is thin.

5 LANDSLIDE RISK ASSESSMENT

5.1 General

Risk assessment and management principles applied to slopes can be interpreted as answering the following questions:

- What might happen? (HAZARD IDENTIFICATION).
- How likely is it? (LIKELIHOOD).
- What damage or injury might result? (CONSEQUENCE).
- How important is it? (RISK EVALUATION).
- What can be done about it? (RISK TREATMENT).

The risk is a combination of the likelihood and the consequences for the hazard in question. Thus, both likelihood and consequences are taken into account when evaluating a risk and deciding whether treatment is required.

The qualitative likelihood, consequence and risk terms used in this report for risk to property are given in Appendix B and are based on the Landslide Risk Management Guidelines, published by Australian Geomechanics Society (AGS, 2007). The risk terms are defined by a matrix that brings together different combinations of likelihood and consequence. Risk matrices help to communicate the results of risk assessment, rank risks, set priorities and develop transparent approaches to decision making.

5.2 Geotechnical Model

A geotechnical model incorporates the various geological, geotechnical and hydrological observations and measurements into a cohesive model of the history and properties of the site. A model should be considered to represent the current understanding of the site and involves elements of interpretation, and it may be subject to change if additional investigations are undertaken.

The model for the site is as follows:

The site is in a coastal setting, with the northern boundary of the site approximately 100m to the southwest of Bass Strait. The site is relatively flat, with the toe of a steep escarpment bounding the western and southern boundary of the site, and a low bench of variable width remnant from earlier earthworks wrapping around the escarpment base.

The site is relatively flat for two reasons.

- Geologically it was probably a wave cut platform prior to having been (partially) covered with younger deposits (aeolian, localised colluvium and/or anthropogenic deposits)
- Historically, the site has been developed as an industrial site (old Tioxide plant), almost certainly involving earthworks to level the site. Following the demolition and decommissioning of the site, the surface has been further modified to facilitate surface drainage.

The depth to rock across the site is generally shallow with the fractured sandstone and siltstone being found at depths ranging from near current ground surface level to about 3.9m below ground level. The bedrock is exposed at the shoreline, about 100m to the north of the site.

Natural colluvium derived from weathering and erosion of the basement rocks is present in the north-western portion of the site, nearest to the escarpment. The colluvium appears to be absent in the eastern and northern portion of the site, with fill materials directly overlying bedrock.

The low bench on the western and southern sides of the site is predominantly composed of soil, both natural and FILL, although shallow (weathered) rock may also be found in some locations.

On the foreshore to the north of the proposed converter station site, Quaternary-aged sands directly overly bedrock.

The bedrock underlying the fill and natural soil, as well as forming the steep escarpment to the south and west of the site, is composed of the Neoproterozoic-aged Oonah Formation turbidites (interbedded sandstone and siltstone), intruded by Neoproterozoic-aged 'Cooee Dolerite' sills. The escarpment face has a thin layer of soil cover.

The turbidite sequence is folded and dips moderately to steeply (~30-70°), and this is inferred to be towards the northwest based on rock exposures to the north of the site. However, the degree of folding may be more complex than the limited data suggests, resulting in bedding angles varying over short distances (e.g. parasitic folding and structural offsets).

Per Jacobs (2022): *Groundwater levels are observed to be shallow across the site and range from 0.68 mbgl to 3.0 mbgl at the groundwater well locations. Groundwater flow direction is to the northeast (towards the ocean) with the groundwater elevation ranging from 8.7 mAHD in the southwest to 5.1 mAHD in the northeast*.

5.3 Potential Hazards

Based on the site observations, subsurface data and available information discussed in the sections above, the following landslide hazards are identified for the site:

Rockfall. Small parts of the site are mapped by MRT as susceptible to rockfall, based on the slope angles of the escarpment (principally to the west of the site). This is the basis for the mapped landslide hazard areas along the western boundary of the site.

Since the site is unoccupied, no monitoring of rockfall has been carried out in recent years. Nevertheless, there is no evidence of rockfall on the site in terms of either apparently dislodged blocks on the exposed parts of the site, or by damage to vegetation caused by dislodged rocks.

The rock itself is generally quite fractured and has defect planes related to both bedding and cleavage, and therefore generally tends to break into relatively small blocks, of cobble to small boulder size.

Whilst there are some exposures of rock on the escarpment slopes above the site, generally there is at least 'some' soil coverage over the rock and the whole slope is densely vegetated.

The rockfall hazard is therefore reduced by:

- The natural tendency of the rock to break into small blocks, which are likely to have shorter run out distances due to lower potential energy
- The moderately steep nature of the slope, i.e., not extremely steep

- The soil coverage which results in relatively little rock exposure on the steeper slopes, and
- The dense vegetation cover, which will help to slow or stop rocks which may become dislodged and also serves to reduce soil erosion

The steep slopes (i.e., the source of any rockfall) are not part of the site, and no vegetation clearing is proposed, nor are there earthworks proposed on the slope. Given the factors described above, the likelihood of rockfall over the design life of the proposed development is assessed as Likely.

Small to medium scale landslide (up to about 3m deep). Such landslides can occur where slopes are locally steep or have been steepened by earthworks (cut or fill) and may involve up to 1,000m^3 of soil. Small to Medium scale landslides may also occur due to localized soil erosion (e.g., from poor control of surface runoff), locally elevated groundwater levels (e.g., seepage water in low-lying areas), or poorly retained cuts or fills.

There is presently no evidence of soil erosion, but groundwater levels are relatively shallow. Considering the proposed ~3m deep cut in the (predominantly soil) bench on the western side of the site, retention of the cut or appropriate batter angles will be required to reduce the likelihood of a small to medium scale landslide where the earthworks are proposed. Assuming the recommendations in this report are followed, the likelihood of a small to medium scale landslide is assessed to be Unlikely.

It is our view that the soil bench does not provide significant support to the adjacent escarpment slope and a reduction in bench width via new cut earthworks will not materially affect the stability of the escarpment slopes. Therefore, the proposed works will not cause or contribute to landslide on the escarpment (i.e., offsite).

The identification of the potential hazards considers both the site and nearby properties and is necessary to address stability issues that may negatively impact upon the site and influence the risk to property.

5.4 Risk to Property

The following table summarises the risk to property of the landslide events in relation to the proposed development as described in Section 3.6 and **assuming limitations in Section 6 are incorporated.**

Table 2. Landslide risk profiles

Scenario	Likelihood	Consequence	Risk Profile
Rockfall in AC Switching Area (or Heybridge Switching Station)	Likely; will probably occur under adverse conditions over the design life	Insignificant; rockfall would not reach towers in switching station	Low
Rockfall against AC Hall building	Likely; will probably occur under adverse conditions over the design life	Insignificant; if rockfall protection measures are constructed uphill of building	Low
Small to medium scale landslide impacting AC Hall building	Unlikely: only applies if building at toe of cut, or crest of fill platform	Medium; some damage to building, can be reduced by engineering design	Low
Small to medium scale landslide in fill/cut batters	Unlikely: If fill or cut batters are relatively flat (or retained) and drainage control measures are incorporated	Minor; minor stabilisation or reinstatement required	Low

The assessment shows that the proposed development presents a Low level of risk, **provided the limitations listed in Section 6 are incorporated in the design.**

5.5 Risk to Life

The calculation of risk to life requires a quantitative assessment. Here, we have used an event tree approach to assess the risk to life for the person most at risk, a construction worker.

An event tree showing a possible sequence of events is presented in Appendix C for the landslide hazards identified above. The risk assessment shows that the Risk to Life is 1.9 x 10^{-7}/ annum.

5.6 Risk Evaluation

As noted in Section 2.1, the performance criteria require that building and works in a landslip hazard area minimise the likelihood of triggering a landslip event and achieve and maintain a tolerable risk from landslip. The proposed tolerable levels of risk were presented in Section 2.1.

Risk to Property

The risk to property is assessed to be Low. As the risk profile is lower than the adopted level of risk, the works achieve and maintain a tolerable risk from a landslip, and thus the requirements of Clause C15.6.1 are satisfied for risk to property. No reduction or protection measures are required beyond the boundary of the site.

Risk to Life

Given that the assessed risk to life is less than the tolerable risk, the requirements of Clause C15.6.1 are satisfied for risk to life.

In addition, the Landslip Hazard Code of the Tasmanian Planning Scheme requires that a landslip hazard report (i.e., this document) makes conclusions regarding:

i. as to whether the use or development is likely to cause or contribute to the occurrence of a landslip event on the site or on adjacent land;

ii. as to whether the use or development can achieve and maintain a tolerable risk for the intended life of the development, having regard to various factors.

The following table presents a summary of the requirements for a landslip hazard report, and the relevant performance criteria for Clause 15.6.1.

the nature, intensity and duration of the use	The nature of the use is the transmission of electricity. We are unaware of the long-term (i.e., post-construction) staffing levels. The duration of the use will be for the life of the converter station, e.g., we presume at least 50 – 100 years. The proposed nature, intensity and duration of the use do not impact on the likelihood of a landslide.	
the type, form and duration of any development	The type of development is the construction and operation of a converter station, which includes electrical transmission infrastructure and various buildings including offices. The type and form of development, particularly the building near the steep slope, can be engineered such that the likelihood of a landslide is minimised.	Clause P1.1
the likely change in the risk across the intended life of the use or development	There are no reasonably predictable factors which we forecast as increasing the risk of landslide at the site across the intended life or use of the development.	

the ability to adapt to a change in the level of risk	Adaptations to the change in the level of risk at the site would likely involve new or supplemental rockfall retention/catch capacity. For example, if the adjacent hillside was exposed to a major bushfire event which denuded the slope of vegetation, the risk of rockfall may increase which may necessitate the addition of a protective barrier against rockfall.	
the ability to maintain access to utilities and services	Utilities and services enter the site from Minna Road. There are no landslide hazards along the access road that could impact utilities and services.	
the need for specific landslip hazard reduction or protection measures on the site;	No specific landslip hazard reduction or protection measures are recommended for the proposed works, except for engineering design for structures on the crest of fill platforms or at the toe of cut slopes.	Clause P1.1
the need for landslip hazard reduction or protection measures beyond the boundary of the site;	The buildings and works do not contribute to landslip on the site, on adjacent land or public infrastructure No specific landslip hazard reduction or protection measures are required beyond the boundary of the site for the proposed work.	Clause P1.2 Clause P1.1 and P1.3
any landslip management plan in place for the site and/or adjacent land	We are not aware of any landslip management plan in place for the site or adjacent land, nor have we identified the need for the development of such a plan.	Clause P1.1

It is our conclusion that the proposed work is not likely to cause or contribute to the occurrence of a landslip event on the site or on adjacent land.

6 DISCUSSION & RECOMMENDATIONS

To ensure the proposed works do not increase the risk profile above Low, it is recommended that the following limitations be enforced:

- Permanent excavations or fill batters more than 1m deep should be retained by an engineer designed retaining wall, or excavated at a slope of 1V:3H or flatter. All batter faces should be protected against erosion (eg by vegetation or erosion mats). Steeper slopes will need to be retained by an engineer designed retaining system. Adequate subsurface and surface drainage should be provided behind any retaining walls.
- A rock-runout study should be undertaken for the proposed building for the AC switching station that encroaches into landslide hazard bands (and which is to be constructed as part of Stage 2 development). The rock runout study will assist in designing any catch fencing required for that area, and/or strengthening of the building to withstand lateral loading from impacts.
- Development in areas near the landslide hazard band should follow good hillside construction practice. A copy of the AGS Geoguide is presented in Appendix D.

If desired, a catch fence (e.g., chainlink/mesh style) may be constructed along the western and southern boundaries of the site to stop or slow down rocks which may runout from the escarpment slopes to the west. This would not reduce the likelihood of rockfall from the slope, but would reduce the impact of any rockfall which did occur.

This landslide risk assessment should be reviewed in the event that the site layout changes such that other buildings encroach onto the landslide hazard bands.

7 REFERENCES

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Tasman Geotechnics, 2024, Geotechnical Investigation Report – Proposed Marinus Link HDD Alignment, Document Number TG24218/1 – 01report.

Australian Stratigraphic Units Database, Geoscience Australia 2024, Ga.gov.au, viewed 3 December 2024, <https://asud.ga.gov.au/search-stratigraphic-units/results/3087/burnie-formation>.

Important information about your report

These notes are provided to help you understand the limitations of your report.

Project Scope

Your report has been developed on the basis of your unique project specific requirements as understood by Tasman Geotechnics at the time, and applies only to the site investigated. Tasman Geotechnics should be consulted if there are subsequent changes to the proposed project, to assess how the changes impact on the report's recommendations.

Subsurface Conditions

Subsurface conditions are created by natural processes and the activity of man.

A site assessment identifies subsurface conditions at discrete locations. Actual conditions at other locations may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time.

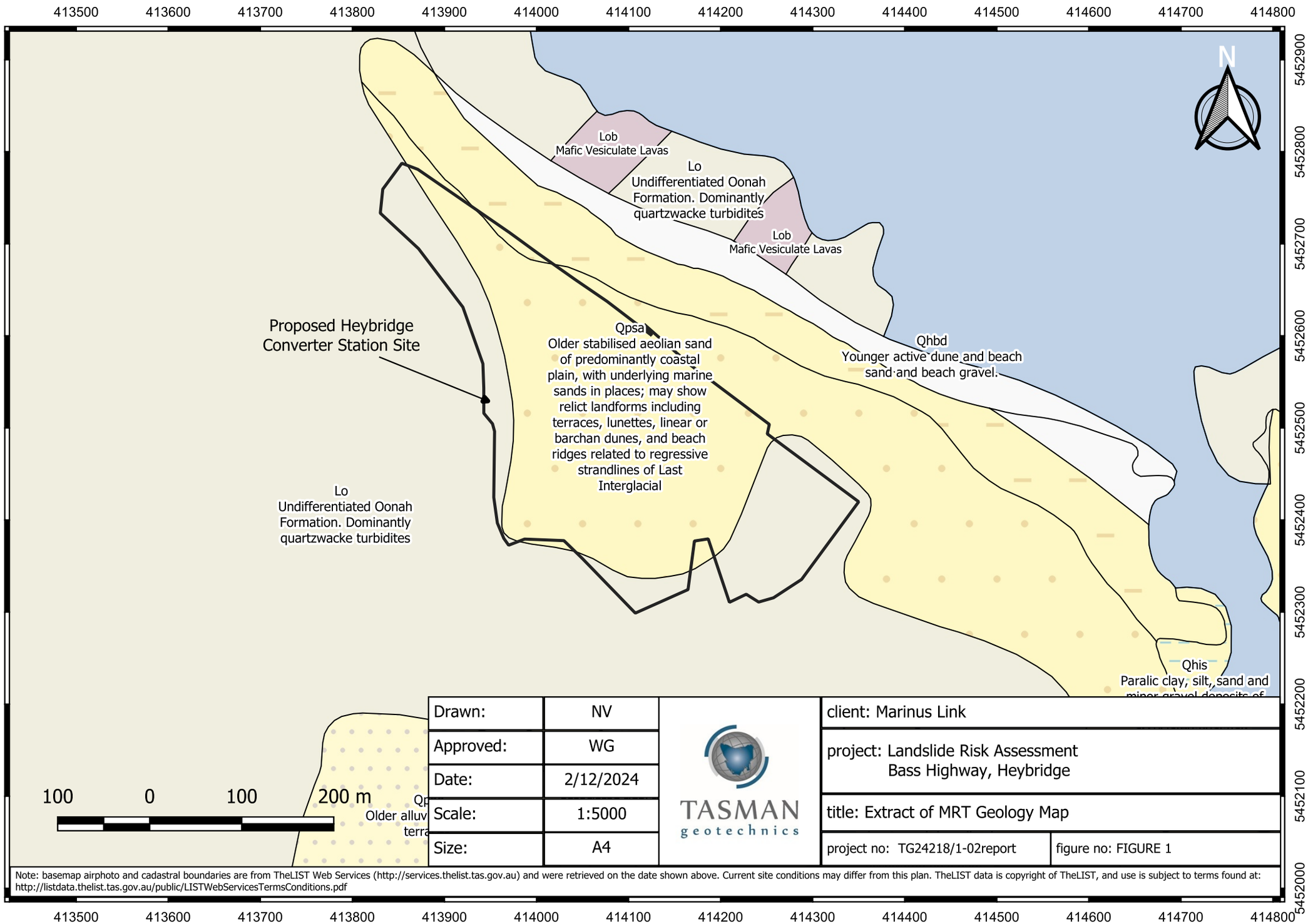
Nothing can be done to change the conditions that exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, the services of Tasman Geotechnics should be retained throughout the project, to identify variable conditions, conduct additional investigation or tests if required and recommend solutions to problems encountered on site.

Advice and Recommendations

Your report contains advice or recommendations which are based on observations, measurements, calculations and professional interpretation, all of which have a level of uncertainty attached.

The recommendations are based on the assumption that subsurface conditions encountered at the discrete locations are indicative of an area. This can not be substantiated until implementation of the project has commenced. Tasman Geotechnics is familiar with the background information and should be consulted to assess whether or not the report's recommendations are valid, or whether changes should be considered.

The report as a whole presents the findings of the site assessment, and the report should not be copied in part or altered in any way.



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Approved:	WG
Date:	2/12/2024
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Size:	A4

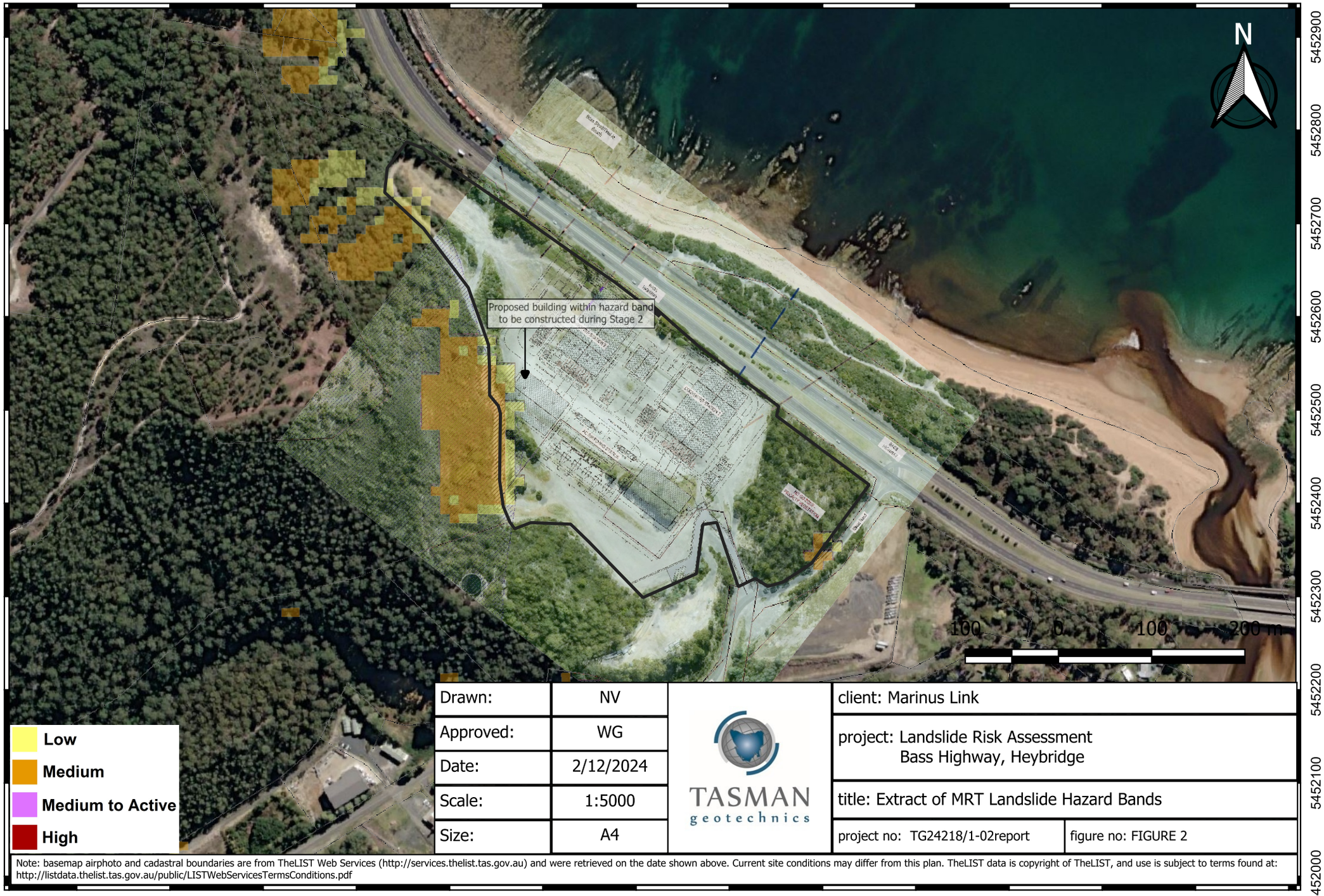
TASMAN geotechnics

client: Marinus Link

project: Landslide Risk Assessment
Bass Highway, Heybridge

title: Extract of MRT Geology Map

project no: TG24218/1-02report | figure no: FIGURE 1



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TASMAN geotechnics

client: Marinus Link

project: Landslide Risk Assessment
Bass Highway, Heybridge

title: Extract of MRT Landslide Hazard Bands

project no: TG24218/1-02report

figure no: FIGURE 2

Note: basemap airphoto and cadastral boundaries are from TheLIST Web Services (http://services.thelist.tas.gov.au) and were retrieved on the date shown above. Current site conditions may differ from this plan. TheLIST data is copyright of TheLIST, and use is subject to terms found at: http://listdata.thelist.tas.gov.au/public/LISTWebServicesTermsConditions.pdf

Drawn:	NV
Approved:	WG
Date:	2/12/2024
Scale:	1:5000
Size:	A4

TASMAN geotechnics

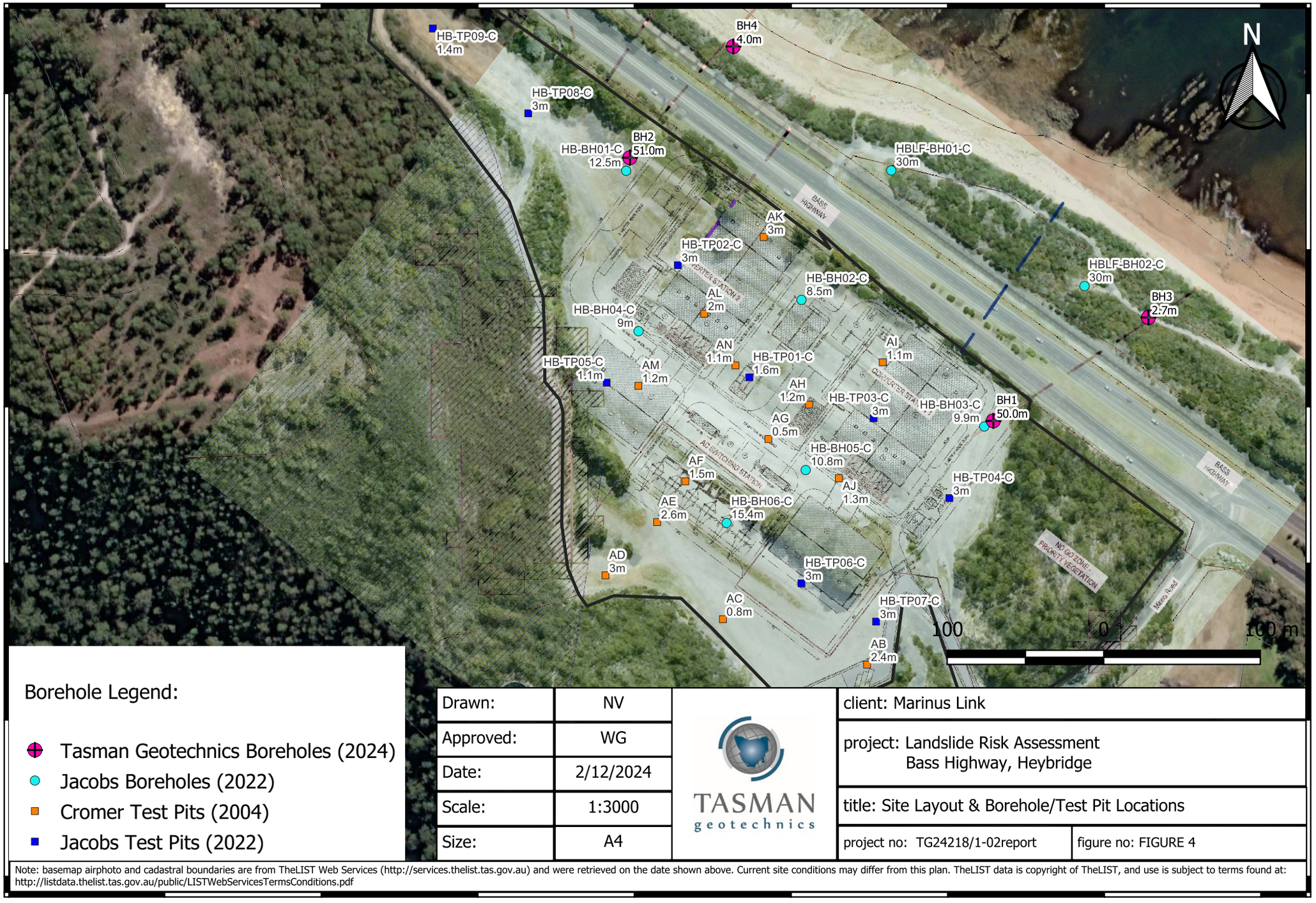
client: Marinus Link

project: Landslide Risk Assessment
Bass Highway, Heybridge

title: Historical Aerial Photograph of Tioxide Plant (1969)

project no: TG24218/1-02report | figure no: FIGURE 3

Note: basemap airphoto and cadastral boundaries are from TheLIST Web Services (http://services.thelist.tas.gov.au) and were retrieved on the date shown above. Current site conditions may differ from this plan. TheLIST data is copyright of TheLIST, and use is subject to terms found at: http://listdata.thelist.tas.gov.au/public/LISTWebServicesTermsConditions.pdf



Borehole Legend:

- Tasman Geotechnics Boreholes (2024)
- Jacobs Boreholes (2022)
- Cromer Test Pits (2004)
- Jacobs Test Pits (2022)

Drawn:	NV
Approved:	WG
Date:	2/12/2024
Scale:	1:3000
Size:	A4

TASMAN geotechnics

client: Marinus Link

project: Landslide Risk Assessment
Bass Highway, Heybridge

title: Site Layout & Borehole/Test Pit Locations

project no: TG24218/1-02report

figure no: FIGURE 4

Note: basemap airphoto and cadastral boundaries are from TheLIST Web Services (http://services.thelist.tas.gov.au) and were retrieved on the date shown above. Current site conditions may differ from this plan. TheLIST data is copyright of TheLIST, and use is subject to terms found at: http://listdata.thelist.tas.gov.au/public/LISTWebServicesTermsConditions.pdf

Appendix A

Site Photographs

Photo 1: Oonah Formation turbidites exposed in cut face at entrance to Heybridge site, looking ~south.

Photo 2: Proposed converter station site, looking southeast.

Photo 3: Steep escarpment to the south of Heybridge site, looking northwest. The low bench where the new cut earthworks are proposed is in the foreground.

Photo 4: Steep escarpment to the south of Heybridge site with visible outcropping turbidites (red circle), looking west.

Photo 5: Natural colluvium at toe of escarpment, looking southwest.

Photo 6: Moderately dipping turbidite sequence (Oonah Formation) exposed on shoreline (BH4 location in background), looking southwest.

Photo 7: Dolerite (Cooee Dolerite) exposed on shoreline, looking northeast.

Appendix B

Landslide Risk Matrix

Terminology for use in Assessing Risk to Property

These notes are provided to help you understand concepts and terms used in Landslide Risk Assessment and are based on the "Practice Note Guidelines for Landslide Risk Management 2007" published in *Australian Geomechanics* Vol 42, No 1, 2007.

Likelihood Terms

The qualitative likelihood terms have been related to a nominal design life of 50 years. The assessment of likelihood involves judgment based on the knowledge and experience of the assessor. Different assessors may make different judgments.

Approximate Annual Probability	Implied indicative Recurrence Interval	Description	Descriptor	Level
10^{-1}	10 years	The event is expected to occur over the design life	Almost Certain	A
10^{-2}	100 years	The event will probably occur under adverse conditions over the design life	Likely	B
10^{-3}	1000 years	The event could occur under adverse conditions over the design life	Possible	C
10^{-4}	10,000 years	The event might occur under very adverse conditions over the design life	Unlikely	D
10^{-5}	100,000 years	The event is conceivable but only under exceptional circumstances over the design life	Rare	E
10^{-6}	1,000,000 years	The event is inconceivable or fanciful for the design life	Barely Credible	F

Qualitative Measures of Consequence to Property

Indicative Cost of Damage	Description	Descriptor	Level
200%	Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequential damage.	Catastrophic	1
60%	Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequential damage	Major	2
20%	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequential damage.	Medium	3
5%	Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works	Minor	4
0.5%	Little damage.	Insignificant	5

The assessment of consequences involves judgment based on the knowledge and experience of the assessor. The relative consequence terms are value judgments related to how the potential consequences may be perceived by those affected by the risk. Explicit descriptions of potential consequences will help the stakeholders understand the consequences and arrive at their judgment.

Qualitative Risk Analysis Matrix – Risk to Property

Likelihood		Consequences to Property				
	Approximate annual probability	1: Catastrophic	2: Major	3: Medium	4: Minor	5: Insignificant
A: Almost Certain	10^{-1}	VH	VH	VH	H	L
B: Likely	10^{-2}	VH	VH	H	M	L
C: Possible	10^{-3}	VH	H	M	M	VL
D: Unlikely	10^{-4}	H	M	L	L	VL
E: Rare	10^{-5}	M	L	L	VL	VL
F: Barely credible	10^{-6}	L	VL	VL	VL	VL

NOTES:

1. The risk associated with Insignificant consequences, however likely, is defined as Low or Very Low

2. The main purpose of a risk matrix is to help rank risks and set priorities and help the decision making process.

Response to Risk

In general, it is the responsibility of the client and/or regulatory and/or others who may be affected to decide whether to accept or treat the risk. The risk assessor and/or other advisers may assist by making risk comparisons, discussing treatment options, explaining the risk management process, advising how others have reacted to risk in similar situations and making recommendations. Attitudes to risk vary widely and risk evaluation often involves considering more than just property damage (eg environmental effects, public reaction, business confidence etc).

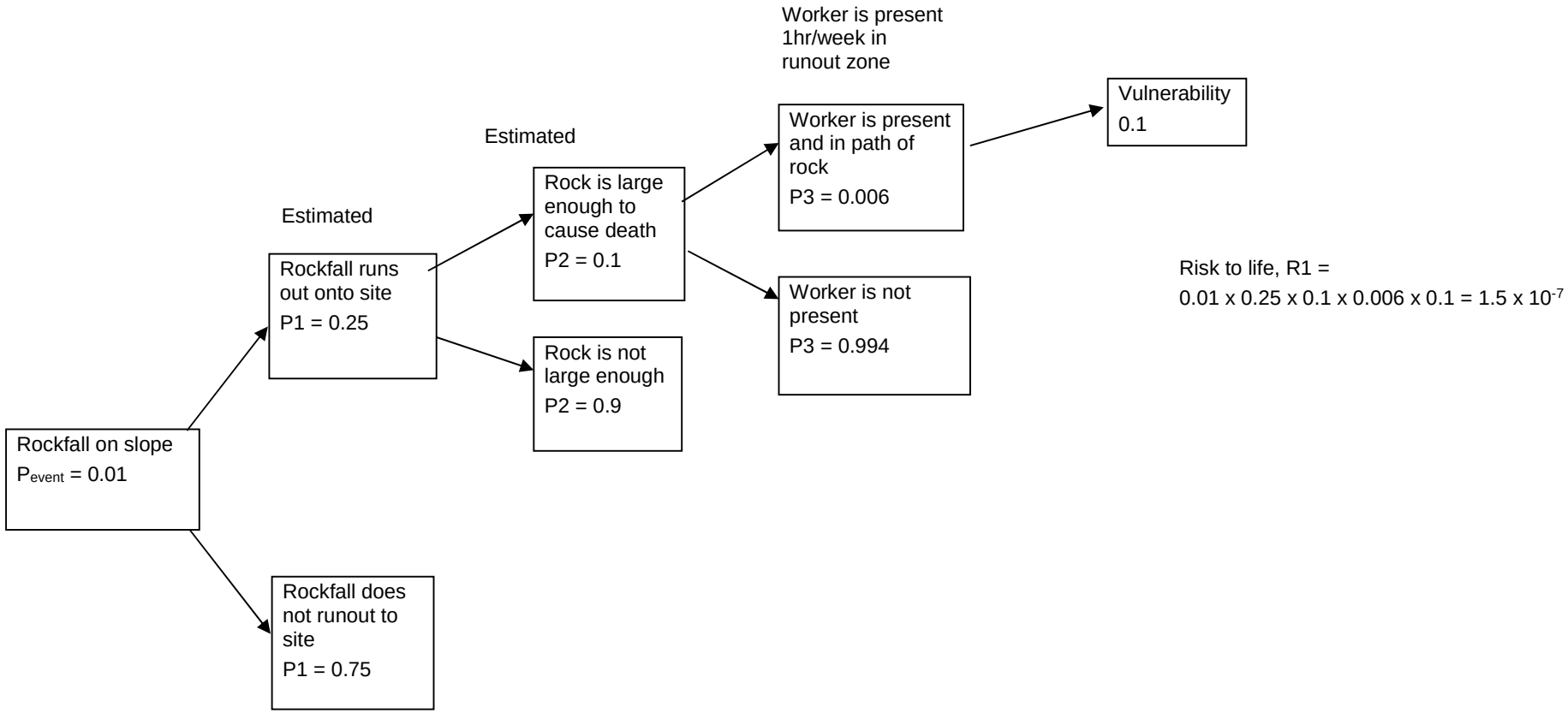
The following is a guide to typical responses to assessed risk.

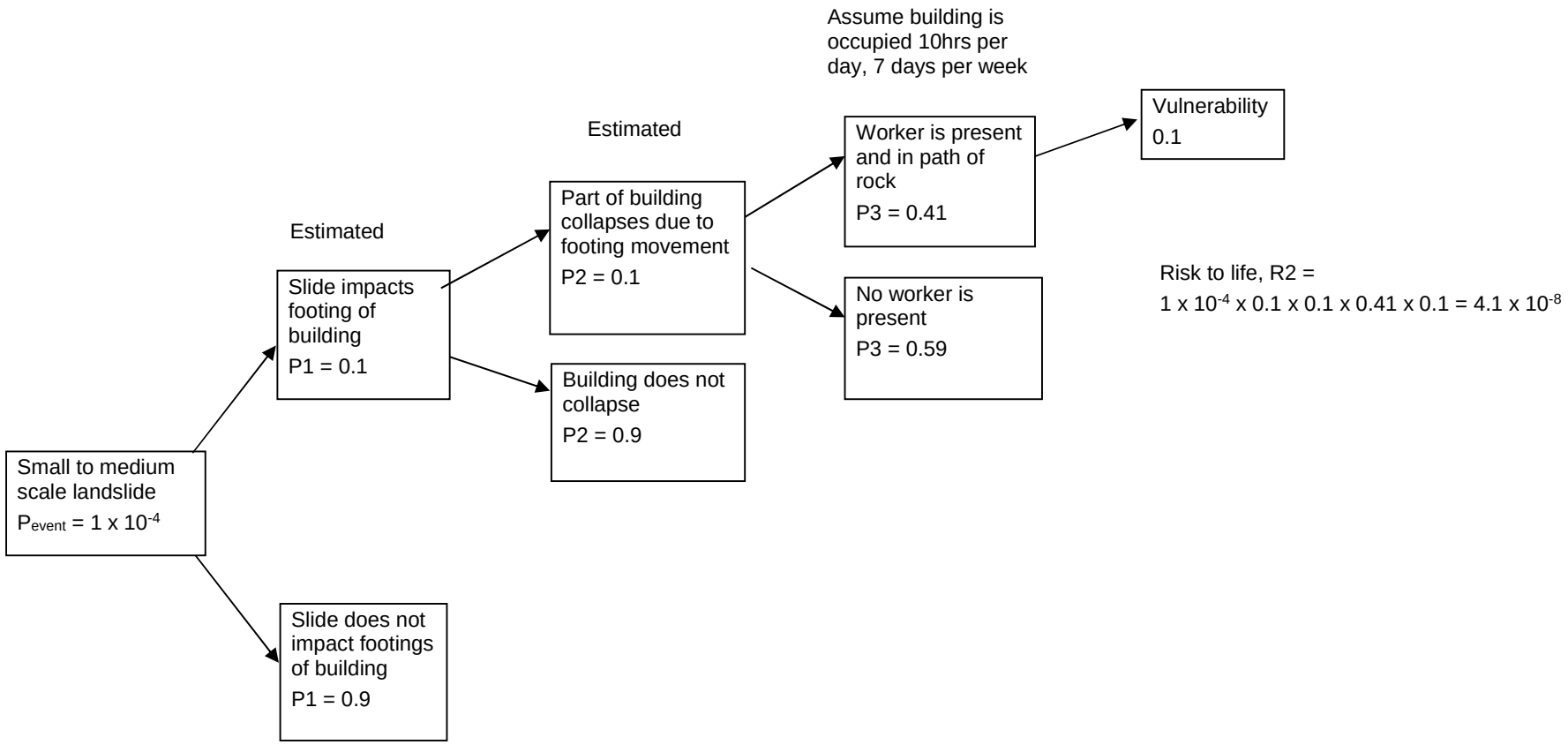
Risk Level		Example Implications
VH	Very High	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than the value of the property.
H	High	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.
M	Moderate	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce the risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.
L	Low	Usually accepted by regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	Very Low	Acceptable. Manage by normal slope maintenance procedures

Appendix C

Risk to Life

Event Tree – Risk to Life, with management measures where recommended





Risk to life, R2 =
1 x 10^{-4} x 0.1 x 0.1 x 0.41 x 0.1 = 4.1 x 10^{-8}

Risk to Loss of Life, R_{LOL} =
R1 + R2 = 1.9 x 10^{-7}

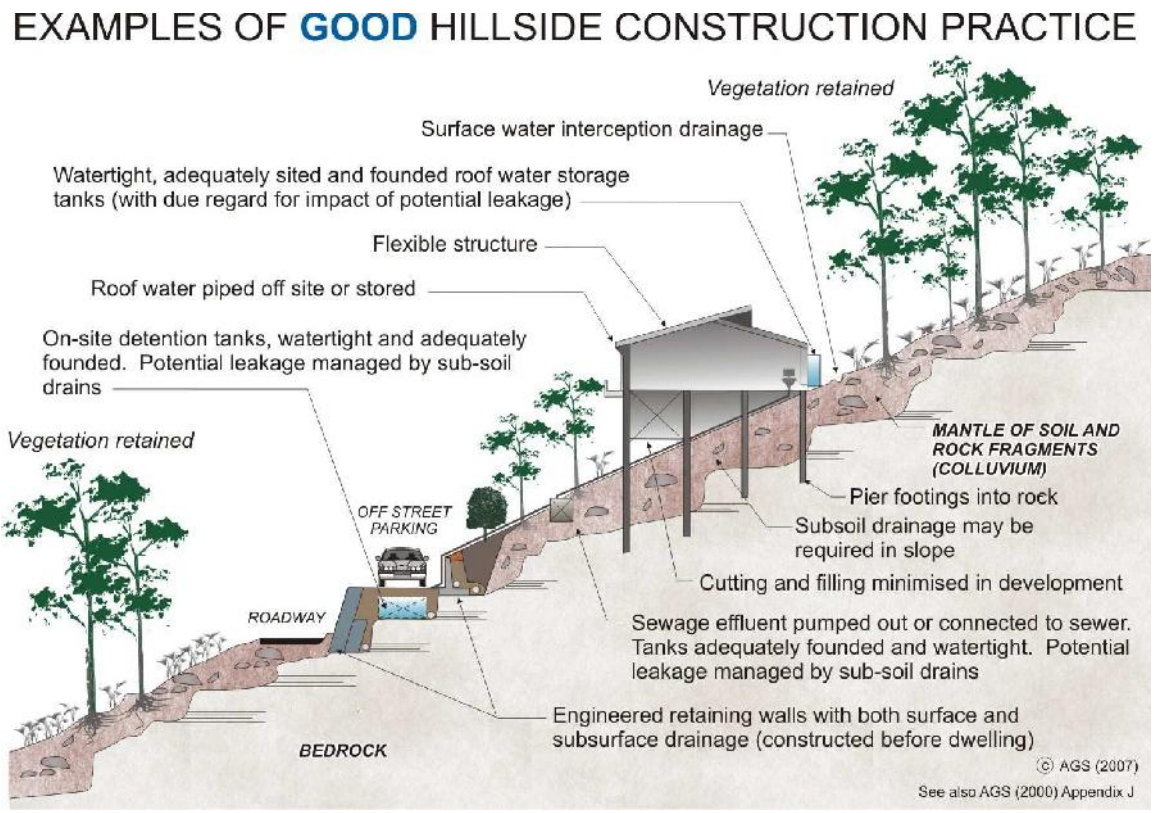
Appendix D

Hillside Construction Practice

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

HILLSIDE CONSTRUCTION PRACTICE

Sensible development practices are required when building on hillsides, particularly if the hillside has more than a low risk of instability (GeoGuide LR7). Only building techniques intended to maintain, or reduce, the overall level of landslide risk should be considered. Examples of good hillside construction practice are illustrated below.



WHY ARE THESE PRACTICES GOOD?

Roadways and parking areas - are paved and incorporate kerbs which prevent water discharging straight into the hillside (GeoGuide LR5).

Cuttings - are supported by retaining walls (GeoGuide LR6).

Retaining walls - are engineer designed to withstand the lateral earth pressures and surcharges expected, and include drains to prevent water pressures developing in the backfill. Where the ground slopes steeply down towards the high side of a retaining wall, the disturbing force (see GeoGuide LR6) can be two or more times that in level ground. Retaining walls must be designed taking these forces into account.

Sewage - whether treated or not is either taken away in pipes or contained in properly founded tanks so it cannot soak into the ground.

Surface water - from roofs and other hard surfaces is piped away to a suitable discharge point rather than being allowed to infiltrate into the ground. Preferably, the discharge point will be in a natural creek where ground water exits, rather than enters, the ground. Shallow, lined, drains on the surface can fulfil the same purpose (GeoGuide LR5).

Surface loads - are minimised. No fill embankments have been built. The house is a lightweight structure. Foundation loads have been taken down below the level at which a landslide is likely to occur and, preferably, to rock. This sort of construction is probably not applicable to soil slopes (GeoGuide LR3). If you are uncertain whether your site has rock near the surface, or is essentially a soil slope, you should engage a geotechnical practitioner to find out.

Flexible structures - have been used because they can tolerate a certain amount of movement with minimal signs of distress and maintain their functionality.

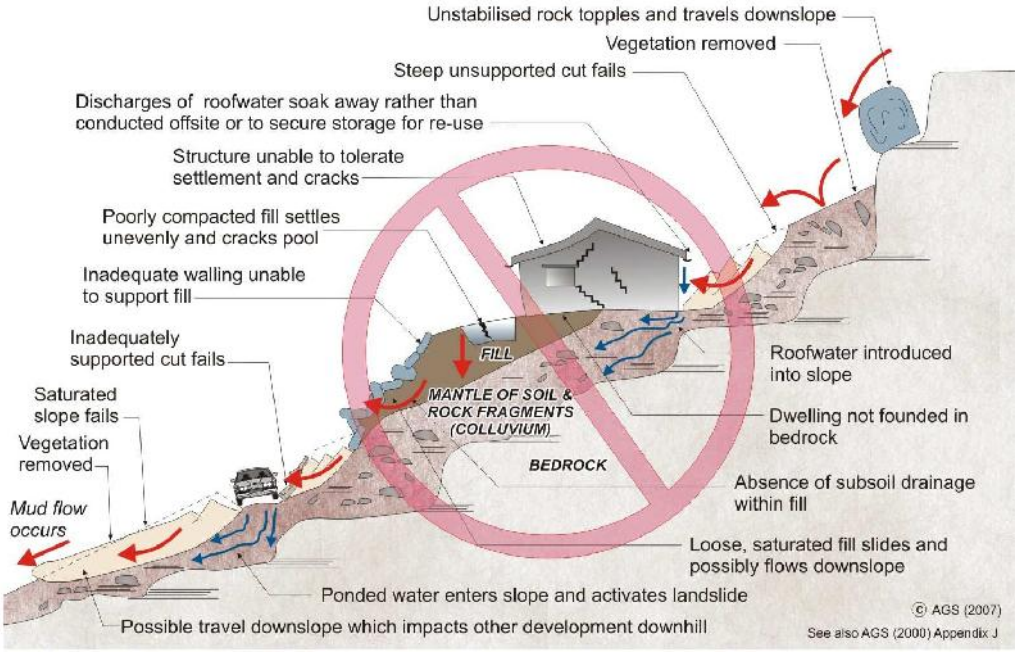
Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing can result in a rise in water table with a consequent increase in the likelihood of a landslide (GeoGuide LR5). An exception may have to be made to this rule on steep rock slopes where trees have little effect on the water table, but their roots pose a landslide hazard by dislodging boulders.

Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact that the cost and anguish associated with any one of the disasters illustrated, is likely to more than wipe out any apparent savings at the outset.

ADOPT GOOD PRACTICE ON HILLSIDE SITES

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

EXAMPLES OF **POOR** HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES POOR?

Roadways and parking areas - are unsurfaced and lack proper table drains (gutters) causing surface water to pond and soak into the ground.

Cut and fill - has been used to balance earthworks quantities and level the site leaving unstable cut faces and added large surface loads to the ground. Failure to compact the fill properly has led to settlement, which will probably continue for several years after completion. The house and pool have been built on the fill and have settled with it and cracked. Leakage from the cracked pool and the applied surface loads from the fill have combined to cause landslides.

Retaining walls - have been avoided, to minimise cost, and hand placed rock walls used instead. Without applying engineering design principles, the walls have failed to provide the required support to the ground and have failed, creating a very dangerous situation.

A heavy, rigid, house - has been built on shallow, conventional, footings. Not only has the brickwork cracked because of the resulting ground movements, but it has also become involved in a man-made landslide.

Soak-away drainage - has been used for sewage and surface water run-off from roofs and pavements. This water soaks into the ground and raises the water table (GeoGuide LR5). Subsoil drains that run along the contours should be avoided for the same reason. If felt necessary, subsoil drains should run steeply downhill in a chevron, or herring bone, pattern. This may conflict with the requirements for effluent and surface water disposal (GeoGuide LR9) and if so, you will need to seek professional advice.

Rock debris - from landslides higher up on the slope seems likely to pass through the site. Such locations are often referred to by geotechnical practitioners as "debris flow paths". Rock is normally even denser than ordinary fill, so even quite modest boulders are likely to weigh many tonnes and do a lot of damage once they start to roll. Boulders have been known to travel hundreds of metres downhill leaving behind a trail of destruction.

Vegetation - has been completely cleared, leading to a possible rise in the water table and increased landslide risk (GeoGuide LR5).

DON'T CUT CORNERS ON HILLSIDE SITES - OBTAIN ADVICE FROM A GEOTECHNICAL PRACTITIONER

More information relevant to your particular situation may be found in other Australian GeoGuides:

- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.