**Contents**

[1 Introduction and scope 2](#_Toc143094020)

[2 Summary of inspections undertaken 3](#_Toc143094021)

[3 Summary of docmentation reviewed 3](#_Toc143094022)

[4 Site description 3](#_Toc143094023)

[5 Damage summary 4](#_Toc143094024)

[6 Land stability assessment 5](#_Toc143094025)

[7 Unmitigated Risk assessment 7](#_Toc143094026)

[8 Mitigation methodology 9](#_Toc143094027)

[9 RBA Placard 11](#_Toc143094028)

[10 Additional information required 11](#_Toc143094029)

[11 Limitations 12](#_Toc143094030)

[APPENDIX A: Scope 13](#_Toc143094031)

[APPENDIX B: NZ Landslides Database Report(s) 14](#_Toc143094032)

[APPENDIX C: Engineering Geological Model 15](#_Toc143094033)

[APPENDIX D: Calculations 16](#_Toc143094034)

[APPENDIX E: Other supporting information 17](#_Toc143094035)

[APPENDIX F: Draft scope for further investigation 18](#_Toc143094036)

# Introduction and scope

This report has been prepared in accordance with the scope attached as APPENDIX A: Scope, which was based on Auckland Council document reference AKLCGEO-1790012875-3847.

*[Notes for authors guidance are presented in italics bounded by square brackets – these should be deleted or replaced before the report is completed]*

|  |  |  |
| --- | --- | --- |
|  |  | Notes |
| Street address |  |  |
| Council Property ID |  |  |
| Property owner name |  |  |
| Client organisation |  |  |
| Client contact name |  |  |
| EQC/Insurer Claim Number |  |  |
| Consultant | Company |  |  |
| Author |  |  |
| Reviewer |  |  |
| Approver |  |  |
| Document date issued |  |  |
| Document version | [start at 1, increase by 1 for each new draft or final issue] |  |
| Document status | Draft / Final |  |

# Summary of inspections undertaken

Site inspections were undertaken on the following dates:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date / time | Inspector(s) names | Areas assessed | Inspection intent | Inspection limitations |
|  |  |  |  |  |
|  |  |  |  |  |

The following hazards were identified on site:

|  |  |
| --- | --- |
| Hazard | Potential mitigation for future site work |
|  |  |
|  |  |

# Summary of docmentation reviewed

The following documents were reviewed:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Document Date | Title | Author(s) / Organisation | Source of document | Notes |
|  |  |  |  |  |
|  |  |  |  |  |

# Site description

The key features of the site are:

|  | Site Description |
| --- | --- |
| Topography |  |
| Geology |  |
| Surface indications of instability[[1]](#footnote-1) |  |
| Cut / fill areas |  |
| Water, springs and overland flow paths |  |
| Site use history |  |
| Vegetation |  |
| Buildings |  |
| Other structures including retaining walls |  |
| Other relevant features |  |

# Damage summary

## Homeowner comments

The homeowner provided the following commentary:

* *[enter “none” if not provided]*

## Building / structure damage from the event

The following damage was caused to the buildings/structures:

* *[enter “none” if no structural damage has occurred]*

## Land Damage from the event

The landslide has been described in the NZ Landslides database, and site photographs attached to that report. The URL for the landslide(s) in the database are:

* *[Insert URL here]*

Reports summarising the data and photographs entered have been downloaded from the NZ Landslides Database and are appended to this report in APPENDIX B: NZ Landslides Database Reports.

## Pre-existing condition of the land

The following damage existed on site before the event:

* *[None identified, or describe briefly and indicate date and severity if possible]*

The following evidence of instability existed on site before the event:

* *[None identified, or describe briefly and indicate date and severity if possible]*

The following evidence of instability in the surrounding area existed before the event:

* *[None identified, or describe briefly and indicate date and severity if possible]*

## Repairs undertaken

The following emergency / temporary works have been undertaken:

|  |  |  |  |
| --- | --- | --- | --- |
| Date(s) | Work undertaken (describe nature of work undertaken, and intent) | Undertaken by (name/org) | Efficacy of work (describe limitations) |
|  |  |  |  |
|  |  |  |  |

The following permanent repairs have been undertaken:

|  |  |  |  |
| --- | --- | --- | --- |
| Date(s) | Work undertaken (describe nature of work undertaken, and intent) | Undertaken by (name/org) | Efficacy of work (describe limitations) |
|  |  |  |  |
|  |  |  |  |

# Land stability assessment

## Engineering geological model

The engineering geological model is presented in APPENDIX C: Engineering Geological Model. This is presented as:

* A plan *[amend this list as appropriate]*
* A cross section through the most critical slope
* Other

Key risks identified relating to the accuracy of the engineering geological model are:

|  |  |  |
| --- | --- | --- |
| Risk No | Description of risk / uncertainty | Implications on findings |
| R1 |  |  |
| R2 |  |  |
| …etc |  |  |

## Geotechnical parameters used

*[If geotechnical parameters have been derived and used, present them in the table format below, or delete the table and enter “Not applicable”]*

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Best estimate Value | Plausible range | Justification for selected values |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

## Qualitative Stability analysis

### Methodology

*[Describe methodology, e.g. mapping of landslides, identification of potential triggers]*

### Results / findings

*[Describe in qualitative terms the relative stability of different parts of the site, and the implications for each residential property on the site or on adjacent sites]*

Slope stability hazards (including existing landslides and potentially unstable slopes) identified are:

|  |  |  |
| --- | --- | --- |
| Hazard No | Brief description of slope stability hazard (inc. type, location, scale, potential failure mechanism) | Likely instability triggers for this hazard |
| H1 |  |  |
| H2 |  |  |
| …etc |  |  |

Potentially vulnerable features (e.g. people, structures, assets) are:

|  |  |  |  |
| --- | --- | --- | --- |
| Feature No | Feature type | Hazard No (to which the feature may be vulnerable) | Description of how the feature may be vulnerable to the hazard (inc. distance from the hazard, potential consequences) |
| F1 |  |  |  |
| F2 |  |  |  |
| …etc |  |  |  |

## Quantitive stability analysis

### Methodology

*[If a quantitative analysis has not been undertaken as part of this study, enter “Not undertaken” here with justification given (for example, not required for this level of study, or insufficient data to undertake reliable modelling)]*

### Calculations

Calculations are presented in full in APPENDIX D: Calculations.

### Results / findings

*[Describe the results]*

# Unmitigated Risk assessment

## Risk of loss of life

The following scenario(s) have been assessed using the AGS2007c methodology:

|  |  |
| --- | --- |
| Scenario description | *[Describe scenario 1]* |
|  | Best estimate Value | Plausible range[[2]](#footnote-2) | Justification for selected values |
| P(H) |  |  |  |
| P(S:H) |  |  |  |
| P(T:S) |  |  |  |
| V(D:T) |  |  |  |
| R(LoL) |  |  |  |

|  |  |
| --- | --- |
| Scenario description | *[Describe scenario 2, delete if not undertaken, duplicate if more scenarios needed]* |
|  | Best estimate Value | Plausible range | Justification for selected values |
| P(H) |  |  |  |
| P(S:H) |  |  |  |
| P(T:S) |  |  |  |
| V(D:T) |  |  |  |
| R(LoL) |  |  |  |

The critical risk to loss of life is:

Based on the guidance in the AGS2007 guidelines, this risk is:

* Acceptable / Tolerable / Intolerable *[delete as appropriate]*

## Risk of loss of property

The following scenario(s) have been assessed using the AGS2007c methodology:

|  |  |
| --- | --- |
| Scenario description | *[Describe scenario 1]* |
|  | Best estimate Value | Plausible range | Justification for selected values |
| Likelihood (Indicative Value of Approximate Annual Probability) |  |  |  |
| Likelihood[[3]](#footnote-3)(Category) |  |  |  |
| Consequences to property |  |  |  |
| Risk level |  |  |  |

|  |  |
| --- | --- |
| Scenario description | *[Describe scenario 2, delete if not undertaken, duplicate if more scenarios needed]* |
|  | Best estimate Value | Plausible range | Justification for selected values |
| Likelihood(Indicative Value of Approximate Annual Probability) |  |  |  |
| Likelihood[[4]](#footnote-4)(Category) |  |  |  |
| Consequences to property |  |  |  |
| Risk level |  |  |  |

The critical risk to property is:

* Very high / High / Moderate / Low / Very Low *[delete as appropriate]*

Based on the guidance in the AGS2007 guidelines, this risk is:

* Acceptable / Usually acceptable / May be tolerated / Unacceptable without treatment *[delete as appropriate]*

# Mitigation methodology

## Long-term mitigation options available

The following options may be available to provide long-term mitigation of the identified risks:

|  |  |  |  |
| --- | --- | --- | --- |
| Option No | Description of option | Likely cost[[5]](#footnote-5) | Residual long-term risk once implemented |
| to life | to property |
| L1 |  |  |  |  |
| L2 |  |  |  |  |
| …etc |  |  |  |  |

## Short-term mitigation options available

|  |  |  |  |
| --- | --- | --- | --- |
| Option No | Description of option | Likely cost[[6]](#footnote-6) | Residual short-term risk once implemented |
| to life | to property |
| S1 |  |  |  |  |
| S2 |  |  |  |  |
| …etc |  |  |  |  |

## Preferred Long-term mitigation option details

The following option is considered to be the most cost-effective practical option which will reduce the risk to at least a tolerable level:

* Option L1 / L2 / S2 *[select one or replace as appropriate]*

*[Provide a list of items with likely costs for the preferred option. Give enough detail to allow checking by a quantity surveyor – for construction this is expected to go to the detail of likely wall dimensions (e.g. wall length, post lengths/diameters/materials). Add a new line to the table for each described item if required.]*

| Stage | Item(s) | Likely cost (NZD, exc GST) | Plausible cost range |
| --- | --- | --- | --- |
| Minimum | Maximum |
| Investigation |  |  |  |  |
| Design |  |  |  |  |
| Consenting |  |  |  |  |
| Construction | *[e.g Timber pole retaining wall, 15m long, 300SED timber poles at 0.9m centres, each 5m long]* |  |  |  |
| Construction | *[e.g. Site clearance]* |  |  |  |
| Construction supervision |  |  |  |  |
| Operational (annualised) |  |  |  |  |
| Maintenance (annualised) |  |  |  |  |
| End-of-life |  |  |  |  |
| TOTALS |  |  |  |

# RBA Placard

## Summary of current situation

|  |  |
| --- | --- |
|  | Current situation |
| RBA placard applied |  |
| Mitigation undertaken since RBA placard applied |  |
| Changes in hazard or risk since RBA placard applied |  |

## Recommended mitigation actions

*[Describe which of the short-term mitigation options presented in Section 8.2 should be implemented before a downgrade to the RBA placard is considered]*

# Additional information required

## Uncertainty

*[Describe the level of uncertainty in your findings]*

## Additional information required

*[Describe additional information required to reduce the uncertainty]*

*[If geotechnical investigations are required to reduce the uncertainty, provide a scope of works in APPENDIX F: Draft scope for further investigation. This shall be in the format of the New Zealand Ground Investigation Specification Volume 2.]*

|  |  |  |  |
| --- | --- | --- | --- |
| Summary of information required | Summary of scope to acquire this information (reference appendix where appropriate) | Likely cost[[7]](#footnote-7) | Benefits |
|  |  |  |  |
|  |  |  |  |

# Limitations

*[Describe any limitations in the report or assessment]*

# APPENDIX A: Scope

# APPENDIX B: NZ Landslides Database Report(s)

# APPENDIX C: Engineering Geological Model

# APPENDIX D: Calculations

# APPENDIX E: Other supporting information

# APPENDIX F: Draft scope for further investigation

1. Note that land damage / landsliding is described in the following section, and is not duplicated here [↑](#footnote-ref-1)
2. Nominally 95th percentile range. It is not anticipated that there will be sufficient data to make a statistical analysis, so this range will be based on expert judgement. [↑](#footnote-ref-2)
3. See AGS2007c Appendix C [↑](#footnote-ref-3)
4. See AGS2007c Appendix C [↑](#footnote-ref-4)
5. Full cost including design, consenting and construction. Costs to ±50%, may be given as a range where uncertainty is higher. [↑](#footnote-ref-5)
6. Full cost including design, consenting and construction. Costs to ±50%, may be given as a range where uncertainty is higher. [↑](#footnote-ref-6)
7. Full cost including supervision, consenting and reporting. Costs to ±50%, may be given as a range where uncertainty is higher. [↑](#footnote-ref-7)