Report to Statutory Management Committee

Date: 8th April 2015

Councillors

WANGANUI DISTRICT COUNCIL

Subject:	**Section 42a Officers Report** **Proposed Plan Change 38 – Land Stability Assessment Areas – Stage Two**
Meeting Date:	**4th May 2015**
Prepared for Chief Executive by:	**Brenda O'Shaughnessy**

1.0 SUMMARY

1.1 Council is presently reviewing the District Plan in phases. This Plan Change is the second of multiple stages of work relating to land stability.

1.2 The purpose of Proposed Plan Change 38 (PC38) is to amend the District Plan maps to include additional sites as either LSAA (A) or (B), as recommended by the second stage of research, relating to potential susceptibility to land instability issues in the Bastia Hill, Durie Hill and Ikitara Road areas of Whanganui. Introduction of PC38 will partially 'give effect' to Section 10 of the Horizon's One Plan, and the Regional Policy Statement (Section 75(3)) and build on previous work completed for the now Operative provisions of Plan Change 25 which introduced the Land Stability Assessment Area (LSAA) overlays A and B, including issues, objectives, policies and rules for activities likely to affect or be affected by land stability issues.

RECOMMENDATIONS (Of the Statutory Management Committee)

That the Council:

1. receives the report.
2. adopts the Decisions Report including the evaluation required under section 32 of the Resource Management Act 1991.
3. accepts, accepts in part or rejects the submissions as set out in Section 7 of the Report for the reasons given.
4. adopts Proposed Plan Change 38 to the Wanganui District Plan.

Appendices:

1. **Copy of the Public Notice**
2. **Submissions Received**
3. **Proposed District Plan Maps**
4. **Operative LSAA Plan Provisions**
5. **Section 32 Evaluation**
6. ***Land Stability Assessment Areas – Ikitara Road, Bastia Hill & Durie Hill – Risk Study Report*, by Opus International Consultants Ltd, 2014**

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2.0 INTRODUCTION

2.1 This Plan Change is one of a series of changes proposed as part of Phase 6 of the wider District Plan review which also address district wide matters and archaeological sites protection.

2.2 One of the significant natural hazards affecting the Wanganui District is land instability. Lack of public awareness and knowledge of the extent of land instability hazards has limited opportunities to avoid or mitigate potential effects on people and property.

2.3 The Local Government Act 2002 and Resource Management Act 1991(RMA) both require councils to manage various aspects of natural hazards. This is supplemented by the provisions of the Regional Policy Statement (Horizons One Plan) who define specific responsibilities and frameworks for natural hazard management, which the Wanganui District Plan must 'give effect to.

2.4 Council has identified ten priority investigation areas within the urban area that are likely to be at least partially susceptible to land instability hazards. Study of five of these areas has now been completed. Sites that are confirmed as being susceptible to land instability hazard are identified in the LSAA overlays as follows:

- Area A comprises sites of very high landslide risk that are unsuitable for future development.
- Area B comprises marginal land requiring geotechnical investigation to confirm suitability for development.

2.5 PC38 identifies sites on the Plan maps that are likely to be susceptible to land instability hazards, within the latest three areas (Bastia Hill, Durie Hill and Ikitara Road). The implication of this is that existing objectives, policies and rules for the LSAA will apply to any development of those sites. PC38 will reduce risk to people and property through managing use of land potentially at risk of land instability.

3.0 PROPOSED PLAN CHANGE

3.1 Purpose

The purpose of PC38 is to incorporate sites in the Bastia Hill, Durie Hill and Ikitara Road areas that are confirmed to be moderately or highly likely to be susceptible to land stability hazards, into the LSAA overlay on the District Planning maps; and to ensure that appropriate assessment and regulation of development occurs to minimise any adverse effects of the hazard risk for the specific property and surrounding area.

3.2 Background Research

Council created the Land Stability Assessment Area (LSAA) A and Area B overlays by way of Plan Change 25 which was made Operative on 13 December 2014. The LSAA replaced the existing Hillside Protection Zone, for

the affected sites. Area A comprises sites of very high landslide risk. Area B comprises marginal land requiring geotechnical investigation to confirm suitability for development. Council had previously identified 10 areas prone to land instability, for priority investigation and the results of the first two studies formed the technical basis for Plan Change 25.

In early 2014 Council commissioned investigations of another three priority areas (Bastia Hill, Durie Hill and Ikitara Road areas), to review the susceptibility to land instability risks. The properties within those study areas, affected by land instability are defined in this study.

Refer to Appendix 6 for maps of the Bastia Hill, Durie Hill, Ikitara Road study areas and a copy of the research report prepared by Opus International Consultants Ltd.

4.0 PROCEDURAL MATTERS

4.1 Consultation Summary

Consultation with a range of stake holders, in accordance with the requirements of Schedule 1, was undertaken as part of formulating the proposed Plan change.

Throughout the wider Plan review process, Council has had on-going dialogue with Horizons regarding natural hazard management, and how to implement the provisions of Section 10 of the Regional One Plan.

Landowners were consulted as follows:

- 22nd April 204 Council send a letter to all landowners within the three study areas, introducing the fact that a study affecting their properties, had been commissioned. The letter included links to the existing rules for LSAA and a map of the relevant area. A timeframe for the study was identified and owners encouraged to contact Council officers with queries.
- 10th June 2014, Council sent a letter to all landowners within the three study areas, providing a link to the completed report entitled *"Land Stability Assessment Areas – Ikitara Road, Bastia Hill and Durie Hill – Risk Study Report May 2014".* The letter invited all landowners to a series of 'drop in' events at the Durie Hill School Hall, to discuss the report and its implications for individual properties.
- 18th, 19th, 24th June a series of 'drop in' sessions at the Durie Hill School Hall, were held between 4.30 and 6.30pm. These were well attended by landowners. It was informal and people could view the implications for their properties and discuss the implications with Council's representative engineer and planners.
- A letter was sent to landowners affected by PC38 advising that Council would be considering the recommendation from the Planning officer that PC38 be notified on 10th September 2014.

- Notification of all parties required by clause 5, 1st Schedule RMA following Council's decision to notify.

4.2 Key Statistics

PC38 was publicly notified in accordance with Clause 5 of the 1st Schedule of the RMA on 10th September 2014, with the period for submissions closing on Friday 10th October 2014. A copy of the public notice is included as Appendix 1.

A total of 7 submissions, were received at the close of submissions. Copies of submissions received are included in Appendix 2.

All submissions received were summarised and the decisions requested by submitters were publicly notified in accordance with Clause 7 of the First Schedule of the RMA. The further submission process closed on Friday 21 November 2014. No further submissions were received.

5.0 STATUTORY AND LEGISLATIVE FRAMEWORK

5.1 Resource Management Act 1991

Section 74 of the Act requires the Council to change the District Plan in accordance with its functions under Section 31, the purpose of the Act in section 5 and the other matters under sections 6, 7 and 8.

Territorial authorities have the following functions under the Act:

31 Functions of territorial authorities under this Act

1. *Every territorial authority shall have the following functions for the purpose of giving effect to this Act in its district:*
    a. *The establishment, implementation, and review of objectives, policies and methods to achieve integrated management of the effects of the use, development or protection of land and associated natural and physical resources.*
    b. *The control of any actual or potential effects of the use, development, or protection of land, including for the purpose of –*
        i. *the avoidance or mitigation of natural hazards*
2. *The methods used to carry out any of the functions under subsection (1) may include the control of subdivision.*

The Council is given these functions for the purpose of promoting the sustainable management of natural and physical resources, which is defined:

5(2) In this Act, "sustainable management" means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for

their social, economic, and cultural wellbeing and for their health and safety while:

a. Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and

b. Safeguarding the life-supporting capacity of air, water, soil and ecosystems; and

c. Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

In accordance with Section 5 of the RMA, PC38 has been developed with a focus on providing for the community's health and safety whilst avoiding or mitigating any adverse effects of activities on the environment, including people and property.

Section 7 matters to which particular regard shall be had in assessing this Plan change are:

(aa) stewardship:…

(f) maintenance and enhancement of the quality of the environment:

PC38 identifies areas prone to land instability, and as such addresses particular issues associated with subdivision, use or development of sites within such areas. Council is acting constructively and proactively to inform the community about known hazards and their extent. This will assist landowners to make decisions in full knowledge of the potential risks and potential costs. In addition Council proposes to assess development on a case by case basis, subject to specified criteria. This will also facilitate an informed decision encouraging efficient use and development of land in hazard prone areas. In turn such an approach will facilitate maintenance of the quality of the environment.

Further guidance and direction on the way in which resources are to be managed is provided in sections 6, and 8 of the RMA.

5.2 National Policy Statements and Environmental Standards

There are no National Policy Statements or National Environmental Standards relevant to this Plan change.

5.3 Regional Policy Statement and Regional Plan (the One Plan)

Sections 75 (3) and (4) of the Act require that a district plan must give effect to any regional policy statement and must not be inconsistent with any regional plan. Horizons Regional Council's One Plan is considered to be relevant to this proposed Plan change where they include requirements for the avoidance and mitigation of natural hazards generally and rules in relation to managing land instability risk.

It is noted that PC38 does not amend any of the objectives policies or methods associated with the LSAA overlay. However for completeness an assessment of how the provisions made Operative by PC25 compare with the objectives and policies of the Operative Horizons Regional One Plan are considered, along with an assessment of how the extension through PC38 to apply those provisions to additional sites gives effect to the RPS is provided in Table 1 below.

Table 1

Operative Regional One Plan (19 December 2014)		**Proposed Plan Change 38**
Objective	**Policy**	**Evaluation**
Objective 9-1: Effects of natural hazard events The adverse effects of natural hazard events on people, property, infrastructure and the wellbeing of communities are avoided or mitigated.	**Policy 9-1: Responsibilities for *natural hazard* management** In accordance with s62(1)(i) RMA, *local authority* responsibilities for *natural hazard* management in the Region are as follows:… (a) *Territorial Authorities* must be jointly responsible for: *(i) raising public awareness of the risks of natural hazards^ through education, including information about what natural hazards^ exist in the Region, what people can do to minimise their own level of risk, and what help is available* (c) *Territorial Authorities* must be responsible for: (i) developing objectives, policies and methods (including rules^) for the control of the use of land^ to avoid or mitigate natural hazards^ in all areas and for all activities except those areas and activities described in (b)(ii) above…	Objective 8.2.1 and policy 8.3.11 give effect to regional Policy 9-1(a) Objective 8.2.2 and 8.2.3 give effect to One Plan Objectives 9-1, 9-3, 9-4 and 9-5 Policies 8.3.2 - 8.3.5 give effect to Policy 9-1 in relation to land instability hazards. Rules for LSAA regulate land instability hazards. Other hazards are progressively being addressed through the phased Plan review process. Rules for the LSAA overlay regulate critical infrastructure on unstable land. PC27 has also addressed this specifically, as will the current Phase 6 review of Utility provisions in the Plan.
	Policy 9-3: New critical infrastructure* The placement of new critical infrastructure* in …… an area likely to be adversely affected by another type of natural hazard^, must be avoided, unless there is satisfactory evidence to show that the critical infrastructure*: (a) will not be adversely affected by floodwaters or another type of natural hazard^, (b) will not cause any adverse effects^ on the environment^ in the event of a flood or another type of natural hazard^,	

	(c) is unlikely to cause a significant increase in the scale or intensity of natural hazard^ events, and (d) cannot reasonably be located in an alternative location.	Objective 8.2.2 gives effect to One Plan Objective 9-1. Policies 8.3.2 – 8.3.5 give effect to Policy 9-4 The LSAA overlay as amended via this decision, gives effect to this policy in relation to land instability. It is acknowledged that rules are required along with detailed site specific scale mapping. This is being developed in conjunction with Horizons and as budgets permit completion of technical research. Policy 8.3.3 gives effect to Policy 9-5 by requiring a precautionary approach in respect to assessment of all hazards and this includes consideration of climate change.
	Policy 9-4: Other types of natural hazards The ... Territorial Authorities must manage future development and activities in areas susceptible to natural hazard events (excluding flooding) in a manner which: (a) ensures that any increase in risk to human life, property or infrastructure from natural hazard events is avoided where practicable, or mitigated where the risk cannot be practicably avoided. (b) is unlikely to reduce the effectiveness of existing works, structures, natural landforms or other measures which serve to mitigate the effects of natural hazard events, and (c) is unlikely to cause a significant increase in the scale or intensity of natural hazard events.	
	Policy 9-5: Climate change The ... Territorial Authorities must take a precautionary approach when assessing the effects of climate change and sea level rise on the scale and frequency of natural hazards, with regard to decisions on: ... (c) activities adjacent to rivers, and streams ...(f) flood mitigation efforts activities, ...	

6.0 Section 32 Evaluation

6.1 The Act requires that when a Council undertakes a plan change that it produce a report evaluating the costs and benefits of primary options considered. This is known as a Section 32 evaluation. (Refer to Appendix 5)

6.2 A re-evaluation has not been completed as required by s32A of the Act as no amendments are proposed as a result of submissions

7.0 SUBMISSION ANALYSIS

The following are the assessment of submissions and further submissions with recommendations by the Planning Officer.

7.1 Submitter Name: Horizons Regional Council

Submission No: 1

Summary:

Support the proposed plan change. The plan change will give effect to the Proposed One Plan regional policy framework for natural hazards (Chapter 9, Policy 9-1). District Council holds responsibility for developing objectives, policies and methods for address natural hazards including land stability.

Decision Sought:

No explicit decision requested.

7.2 Officer Comments:

The support of the Regional Council is noted and appreciated.

7.3 Officer Recommendations:

That Submission 1 from Horizons Regional Council be **accepted.**

No amendments are recommended as a result of this submission.

7.4 Submitter Name: Rowan and Rosemary McGregor

Submission No: 2

Address: 28 D'Arcy Road

Summary:

Not opposed to intent of Plan change, but lack of sophistication taken by Council, which would not stand up to challenge. Would like to make alterations to the proposed Plan change:

- Consider that Council has a duty of care to property owners as building consents have been approved for their dwelling; and
- That the method of assessing slippage risk is inadequate, having relied on desktop assessment of soil maps and aerial photographs, given what is at stake.
- The dwelling was built in 1977 and shows no signs of settlement as implied by LSAA(A) having risk of failure period of 10-50 years.
- The proposed change will have a negative effect on their property value.
- There is sandstone throughout the area, including approximately 3.7m under the level of their house footings, which provides a stable substrate.

Decision Sought:

1. That heading wording is less alarming and reflects the intent of the [plan change].
2. Remove the proposed zone from 28 D'Arcy Road.
3. Would like an explanation for why Area B is proposed over the submitters land, given the research undertaken by the submitter.

Figure 1: LSAA map - 28 D'Arcy Road

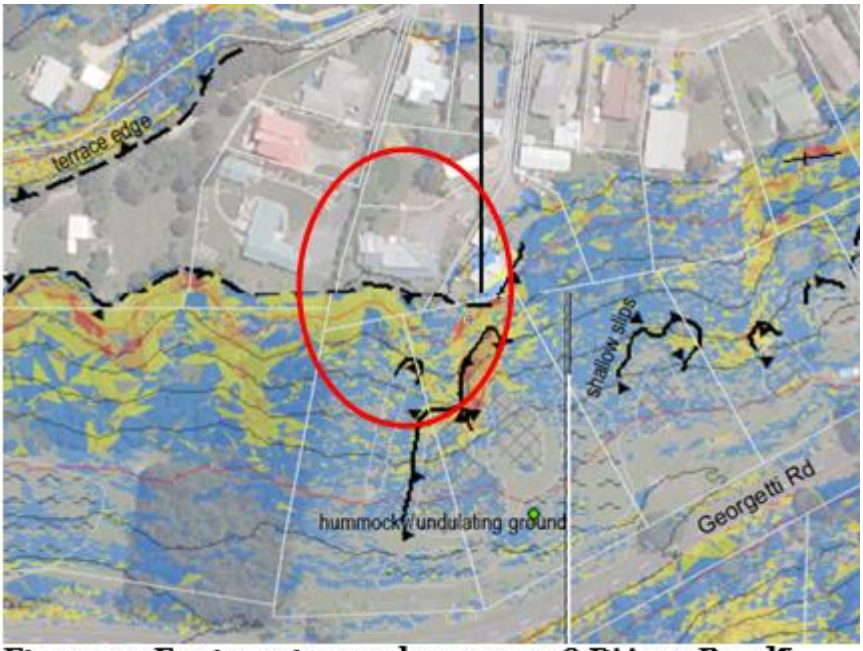


Figure 2: Engineering geology map 28 D'Arcy Road

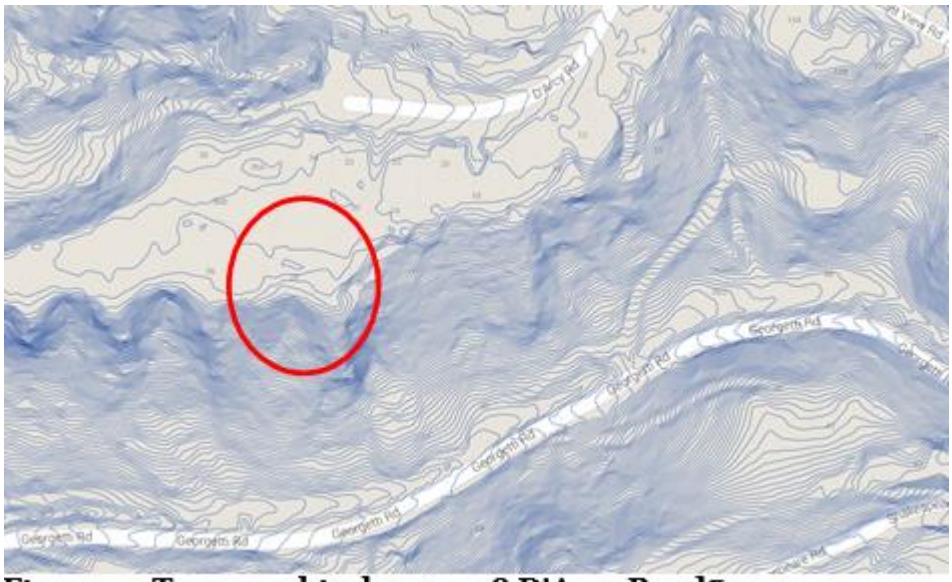


Figure 3 : Topographical map – 28 D'Arcy Road

7.5 Submitter Name: Mark and Gaylene Buckley

Submission No: 3

Address: 26 D'Arcy Road

Summary:

- Dwelling is built over sandstone, which is considered to be a stable platform for the building; it has building consent; and the foundation was designed by a qualified engineer.
- The method of assessing the slope risk was totally inaccurate for the property.
- The proposed plan change would have a bearing on their property values.

Decision Sought:

1. Remove slip protection zone from 26 D'Arcy Road.

7.6 Submitter Name: Mark Buckley

Submission No: 4

Address: 26 D'Arcy Road

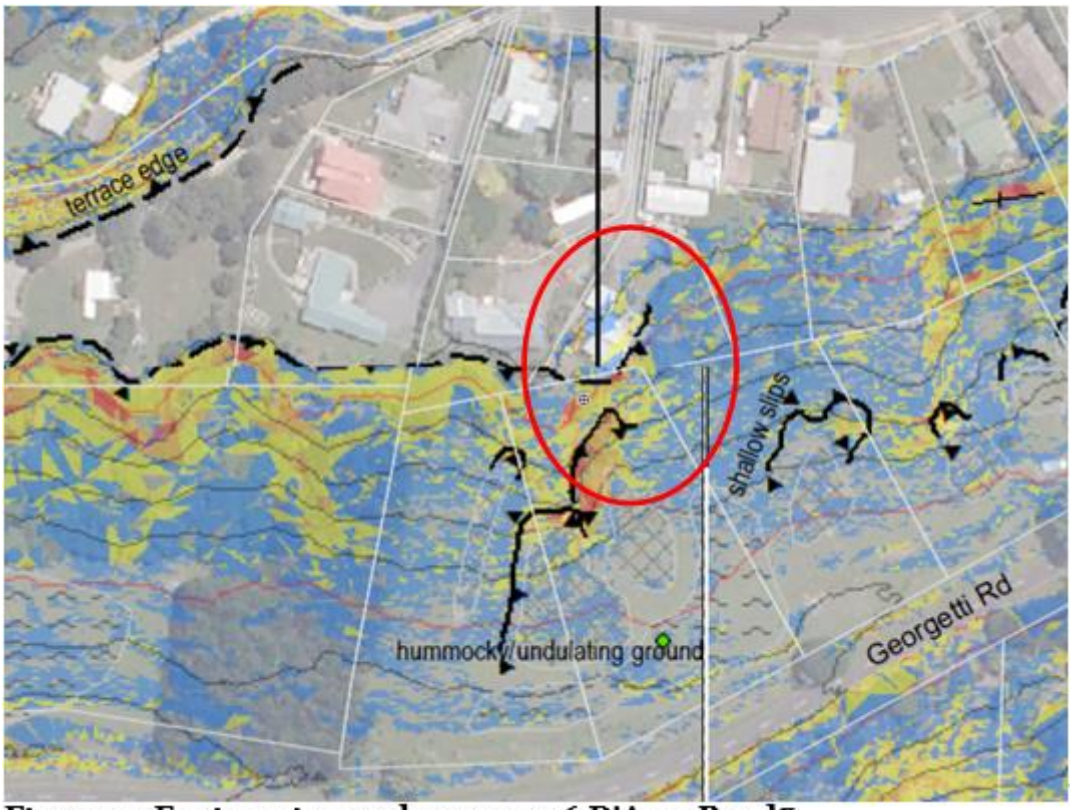
Summary:

- Opposed to the plan change, as the proposed slip zone was compiled by a desktop and drive-by study and is inaccurate.
- The dwelling at 26 D'Arcy is constructed on sandstone rock; the surrounding area is also sandstone rock; and the foundation was designed by a qualified engineer.

Decision Sought:

1. Remove proposed slip protection zone from 26 D'Arcy Road.

Figure·4·:·LSAA·map·—·26·D'Arcy·Road¶



Figure·5·:·Engineering·geology·map·26·D'Arcy·Road¶

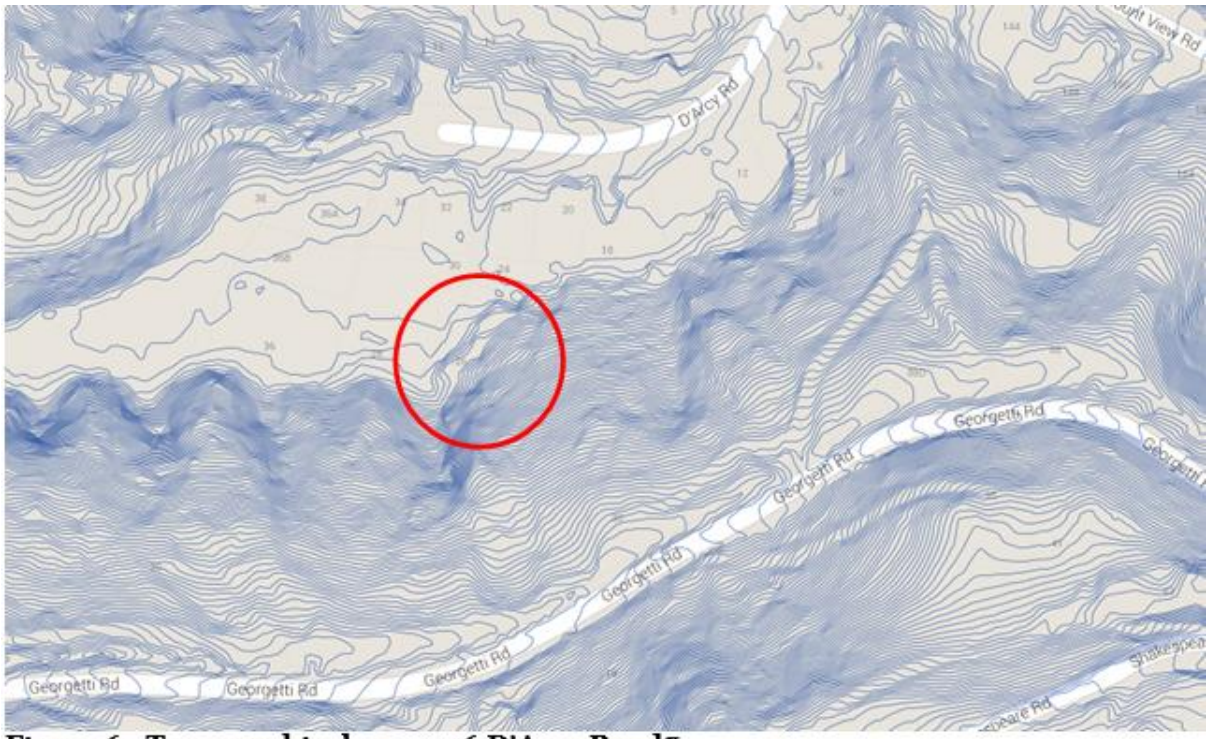


Figure 6 : Topographical map – 26 D'Arcy Road

7.7 Submitter Name: Christopher Heywood

Submission No: 5

Address: 26 Turoa Road

Summary:

Not opposed to intent of Plan change, but lack of sophistication taken by Council compared to what is at stake would not stand up to challenge.

- Council has a duty of care to property owners as building consents have been approved for their dwelling; and
- The dwelling was built in 1963 and shows no signs of settlement as implied by LSAA (A) having risk of failure period of 10-50 years. Our property has no recorded landslides or slips since 1963, and we see no evidence of excessive erosion through water runoff or evidence of erosion. We have completed due diligence and do not believe we are in imminent danger of a landslide occurring.
- Purchasers and insurance companies react to headlines. The plan change and slip protection zone at 26 Turoa Street will reduce property value and increase insurance costs unduly.
- The method of assessing slippage risk is inadequate, having relied on desktop assessment of soil maps and aerial photographs, given what is at stake. The research has been under-resourced.
- Without inspection Council has no justification for the LSAA going right through our house. Council is not undertaking its RMA role.

- Our property has similar gradient as sites treated differently in the study, when our property also has abundant trees and vegetation and ground cover and uncompromised retaining walls.

Decision Sought:

1. That heading wording is less alarming and reflects the intent of the [Plan change].
2. Remove reference to LSA Area A, retaining area B until a more comprehensive study has been carried out.
3. An explanation of inconsistency of the report.
4. Make zoning of hill slope south of Turoa Road consistent with the zoning of the hill slope to the north of Turoa Road.

Figure 7: LSAA map – 26 Turoa Road

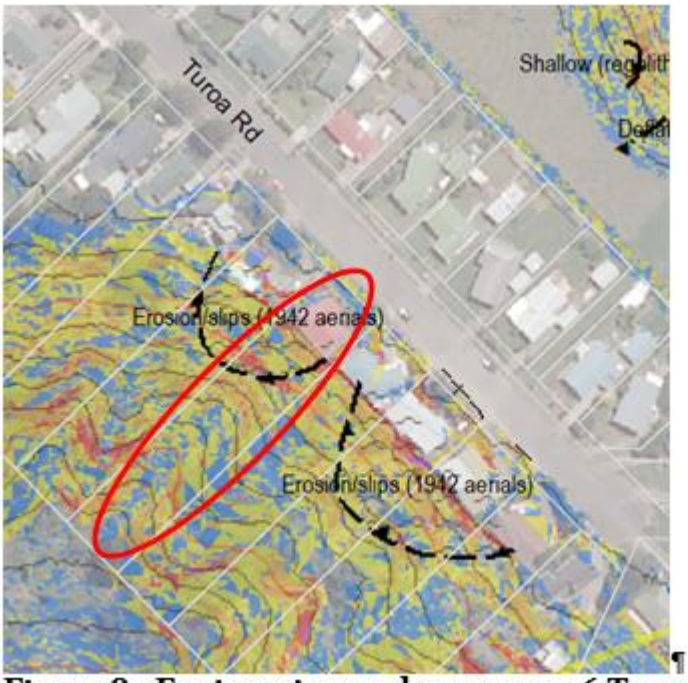


Figure 8 : - Engineering geology map – 26 Turoa Road

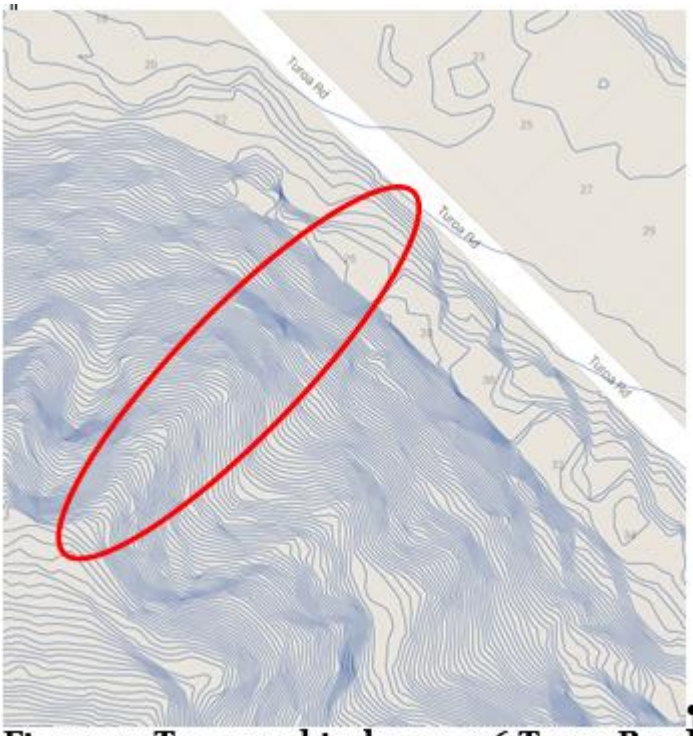


Figure 9 : - Topographical map – 26 Turoa Road

7.8 Submitter Name: C.C. and R.C. Ogle

Submission No: 6

Address: 22 Forres Street

Summary:

Opposed to the plan change in its proposed form.

- The need for the zoning change at 22 Forres Street and Durie Hill/Vale area is to meet a perceived and unproven need on the wider scale – using a scattergun approach, rather than targeted.
- Proposal is unfair in that land with the same contour as our re-zoned land is not included in the zone change.
- The proposed change has no regard to stabilisation already carried out; and
- The re-zone may decrease property values for rezoned land.

Decision Sought:

1. Total reassessment of the need for the re-zone process, especially to demonstrate the need for it.
2. Reassessment of land stability at 22 Forres Street and neighbouring properties to ensure fairness of changes.
3. An overlay which reflects land stabilisation measures such as retaining walls, trees for each property.
4. A new property valuation to reflect re-sale value.

Figure 10 : LSAA map – 22 Forres Street

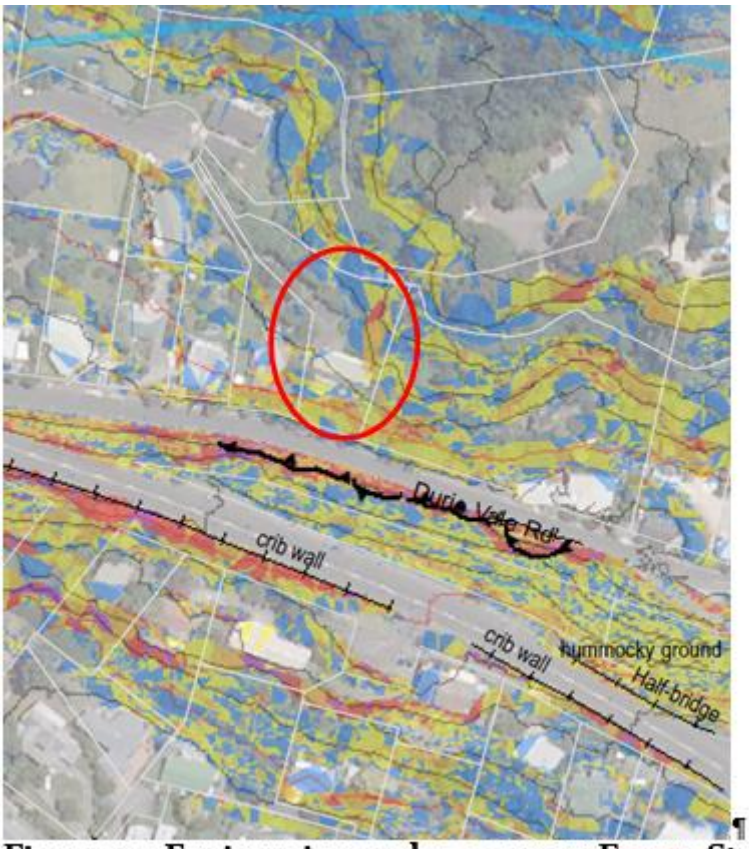


Figure 11 : Engineering geology map 22 Forres Street

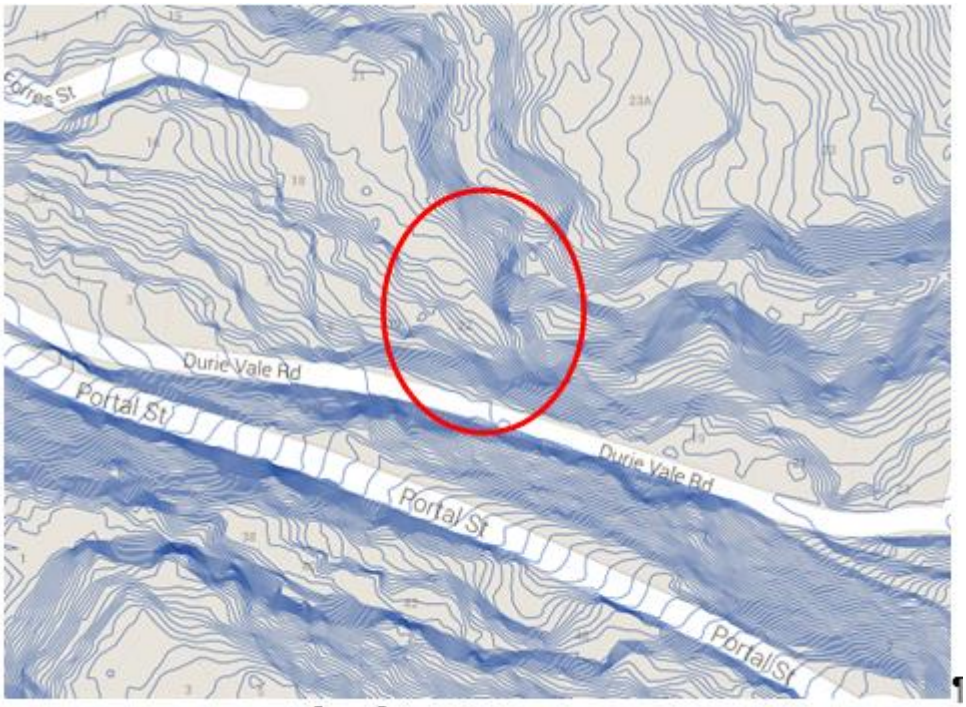


Figure 12 : Topographical map – 22 Forres Street

7.9 Submitter Name: Russell Goudie

Submission No: 7

Address: 21 Stark Street

Summary:

Accepts that western end of the site above Portal Street would be classified as Zone A for a length of 10 metres

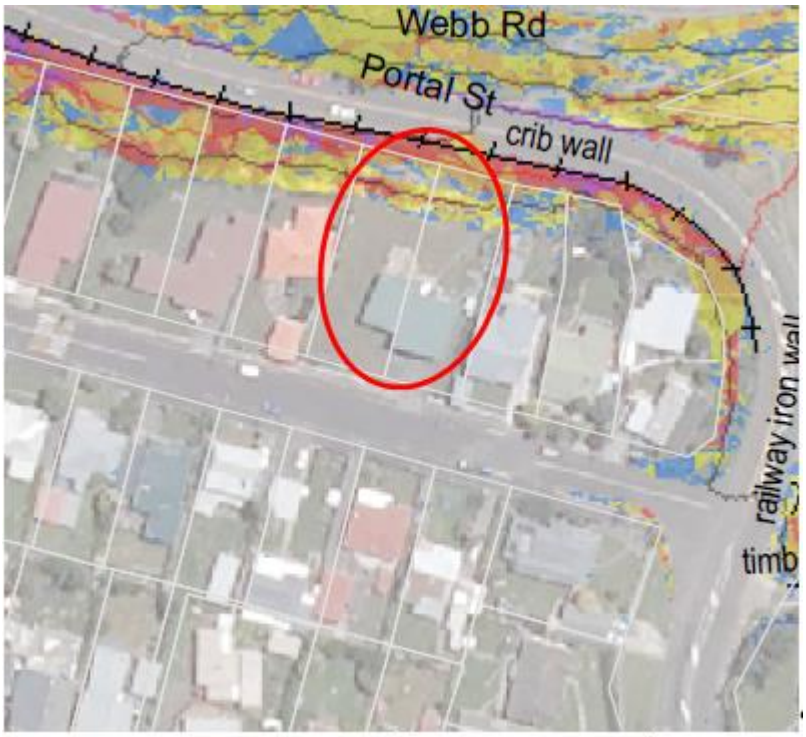
Opposed in part to the plan change in its current form, as it is based on desktop and historical information only.

- Survey lines do not accurately reflect the topography.
- Zone A does not do not take into account remedial and stabilising work such as drainage, retaining walls, lawn, landscaping and reduction in the gradient of the bank.

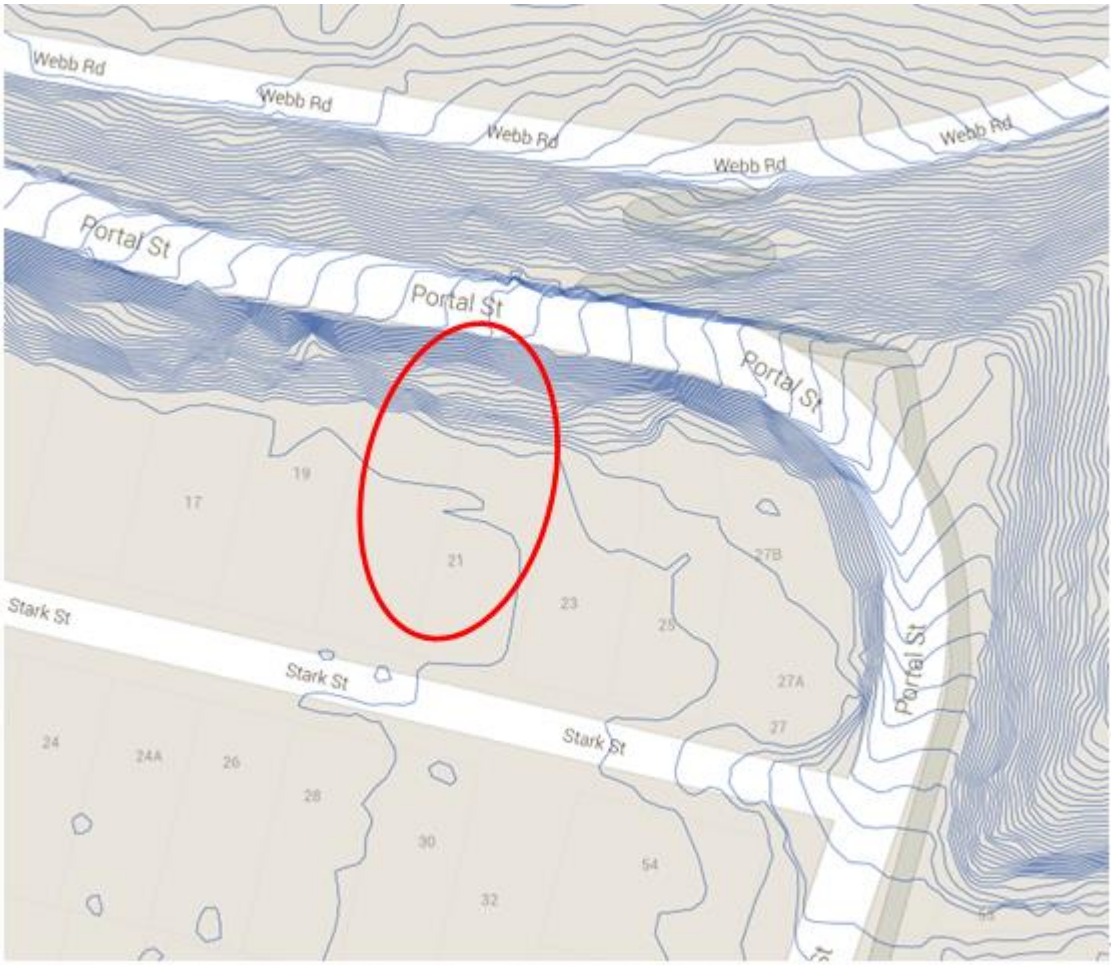
Decision Sought:

1. Carry out a site investigation of the section above Portal Street, and reconsider the zone beyond 10m from the western boundary.
2. Move several properties [unspecified] out of A zone into B zone, or remove classifications altogether.

Figure 13: LSAA map – 21 Stark Street



Figure·14·:·Engineering·geology·map·21·Stark·Street¶



Figure·15·:·Topographical·map·–·21·Stark·Street¶

7.10 Officer Comments Relating to Submissions 2 - 7:

Why the Plan Change is necessary: *Response to Submitters 2 - 7*

1. Council has a responsibility to the wider community to ensure that any future use or development of potentially unstable land does not worsen or exacerbate the hazard potential, as this would have an adverse effect on the environment and be contrary to the purpose of the Resource Management Act 1991.
2. Council research confirms a potential risk to life and the environment within the proposed Land Stability Assessment Areas. As a result, Council must take a precautionary approach to future development potential as required by the Horizon's Regional Council One Plan, which Council must give effect to.
3. Balancing the costs and benefits to both the wider community and individual property owners, Council believes research undertaken to date is sufficient to guide it in establishing broad thresholds for development.
4. The cost of further research to identify a more refined area of potentially affected land, would likely be significant. Council accepts the view of its engineering consultants that the boundaries of the proposed zone and development restrictions would be unlikely to alter significantly with more detailed analysis.

Zone Name/ Headline Information: *Response to Submitters 2 and 5*

5. Through Plan change 25 which created the Land Stability Assessment Areas, Council acknowledged that the naming of this overlay does have influence as suggested by these current submitters.
6. The name was amended at the suggestion of submitters, from 'Hillside Protection Zone' which has applied to a limited number of sites since at least 2004, to the more positive term 'Land Stability Assessment Area' to acknowledge the purpose of the overlay is to require detailed assessment of any land susceptibility at the time development is proposed for a site.
7. This Plan Change does not propose to amend any of the Plan provisions other than to alter the maps to include additional sites and delete the now superfluous Hillside Protection Overlay Zone.

Duty of Care: *Response to Submitters 2, 3, 4 and 5*

8. The Council has a duty of care to inform residents of natural hazards as knowledge about them becomes available, regardless of previous consents that may have been issued.
9. The issue of a Code of Compliance, indicates Council has reasonable grounds to believe that a particular structure has been built in accordance with the Building Consent issued in compliance with the Building Code/ Building

Act and Building Regulations in effect at the time of issue. This confirms the structure is appropriate given knowledge at time of construction, but do not remove the inherent risk identified for the site generally by the LSAA overlay.

Existing Stable Houses and Stabilisation: *Responses to Submitters 2- 7*

10. The risk zoning applies to the underlying ground, and the Land Stability Assessment Area (LSAA) overlay does not imply that existing structures within the Area are inherently unstable. However if development works are undertaken without due regard to the land stability hazards, then people and property may be at increased risk. The LSAA rules attempt to ensure that appropriate consideration of land stability hazards are made before future development works are undertaken.

    The LSAA rules also ensure that good practice is followed when development works are planned, and that poorly planned and executed development work that would likely have a negative impact on property and people is avoided. The LSAA rules require a geotechnical report be prepared before most land disturbance activities are commenced.

11. Future works, for instance on neighbouring properties or on the roadway below, will need to consider the risk of instability and ensure any proposed works are appropriately designed.

12. This will over time provide increased certainty for property purchasers that structures have been designed and constructed appropriately taking account of the hazard potential.

Property Values and Insurance Costs: *Response to Submitters 2, 3, 4, 5, 6*

13. The actual level of risk remains the same as before the study was undertaken. With the LSAA rules in place, Council is better able to manage the risk of future development causing instability and damage to the property or adjacent properties, which is more likely to affect property prices and insurance costs.

14. Implications for market values of individual properties do not outweigh Council's obligation to take a precautionary approach where hazard susceptibility is identified and to inform the community and to avoid works that may worsen the risks to people or property.

    The impact on insurance and property values will be affected by a range of variables for each property such as:

    - Extent to which insurance and market already recognises and accounts for the hazard potential.
    - The portion of the site susceptible to the hazard.
    - The location of dwellings or other buildings relative to the hazard area.

- The extent to which structures can be demonstrated to have been designed and constructed appropriately for the site specific hazard potential.
- Familiarity of the market to what hazard susceptibility means and recognition that many hazards exist and are recognised in the Plan including flood, coastal and land instability. In future, the Plan is likely to also include identification of sites susceptible to liquefaction and possibly tsunami hazards.
- Extent to which the Plan consistently identifies and controls development on sites of similar hazard vulnerability in the Plan, ie Council has only investigated half of the areas believed to be susceptible to land instability, as these are addressed over time, a greater awareness and a certain normalising effect may occur.

Adequacy of Study Methodology: *Response to Submitters 2, 3, 4, 5*

15. The study methodology has used remote sensing methods, historical photographs, and existing soil and geological maps, supplemented with a walkover of the study area by an engineering geologist. This has identified areas where further investigations and reporting are required before certain activities are undertaken. Undertaking this site specific work for all properties would be cost prohibitive, particularly when further development work may never occur on a number of properties.

16. The level of information (or certainty about the extent and severity of any site specific hazard) required is significantly more onerous to enable development of a specific site susceptible to land instability, than the level of information required to be provided by Council to demonstrate that areas are susceptible to land instability hazard and as such should be recorded in the Plan.

    The rationale for this difference in thresholds of information is that the former would permit development and Council needs to be certain that it will be safe, whereas inclusion of properties within a hazard overlay is simply an indicator that further detailed investigation is required to demonstrate that development can occur without undue risk to people or the environment.

17. It is for private land owners to demonstrate that land can be safely developed without adverse effect on the environment. It is not Council's role to investigate the suitability of individual sites for development, rather it is for Council to take a precautionary approach to the identification of hazards and the management of risks of development on hazard prone sites.

Sites Treated Inconsistently: *Response to Submitters 5 and 6*

18. Submitters note that properties with the same or similar gradient are treated differently in the study.

    Council's engineering consultant advises that:

    Area A and B take into account the run out areas at the base of slopes and the area at the top that may be affected by slope instability. Therefore some areas that appear similar may be in different zones.

19. Submitter 5 requests that "Council make zoning of hill slope south of Turoa Road consistent with the zoning of the hill slope to the north of Turoa Road and explain why hill areas are treated inconsistently in the report.

    Council's engineering consultant comments in response that:

    The historic aerial photos showed evidence of erosion and instability, particularly over the lower part of the slopes. The retaining walls constructed along the base of these slopes would have been constructed into the accumulated slip/fan materials. These would be to provide space for construction of the houses along the road, rather than to provide toe stability to landslide deposits extending some 20 - 25 metres up the hill. The slope angles are commonly steeper than 40degrees, with some scarp features within the gullies on that slope being steeper than 50degrees. The overall height of the slope is over 80 metres from the crest of the hill down to road level, and is 50 metres in height where the slope angles are >30degrees. By comparison, the slopes on the other side of the road are shallower (generally less than 40 degrees.) and less than 30 metres from the ridge crest to the base of the slope. Our assessment was based on the potential impacts to people and property, and the height, angle and historic precedence of erosion on these slopes suggests significant volumes of material could be mobilised by future instability that would place developments at high risk.

Need to rezone 22 Forres St is unproven: *Response to Submitter 6*

20. The proposed Land Stability Assessment Areas are based on topographical and geological data, a walkover of the area, and examination of historical photographs. Historic instability features have been identified during this process. Areas with similar characteristics to those where failures have occurred have been identified as having the potential for future instability.

21. The study attempts to categorise the study area into Area A, Area B, or areas that are unlikely to be affected by land instability. Areas that have not been affected by instability in the past, but have the same or similar characteristic as those that have, are considered likely to have stability issues. The LSAA rules require that these be investigated and addressed if future works not meeting the rules, are planned.

Survey lines inaccurately reflect topography: *Response to Submitter 7*

22. Submitter 7 seeks that Council carry out a site investigation of the section above Portal Street, and reconsider the zone beyond 10m from the western boundary. However in response, it is not Council's role to undertake site specific investigations, as this is the responsibility of the landowner in the event that works are proposed. Council must be satisfied that it is reasonably likely that the land is susceptible to instability and that a precautionary approach prior to development being permitted is the most appropriate way to give effect to Horizon's One Plan and to achieve the purpose of the Act.

23. The topographical data reviewed was obtained from LIDAR survey data from which 0.5m contours through the city have be created. This is the most accurate topographical data available. Observations of the hillside above Portal St indicate these contours to be generally correct.

Underlying land is stable 28 D'Arcy Rd: *Submitter 2*

24. In relation to submission point (f), and the attached photos and aerial plan submitted, on the subject of supporting foundation stability, Council's engineering consultant makes the following response:

    The material underlying Durie Hill and Bastia Hill form part of the Shakespeare Group, which consists of soft rocks including sandstone, siltstone, limestone and conglomerate. This Group is overlain by younger marine terrace deposits. In the general area of the property, ground contours and visual observations reveal relict landslides from the upper hill area, with deposited landslide material forming the hummocky ground near the base of the hillside (refer to Figure 2 and Figure 3, in which the scallop-shaped features at the top of the slope indicate head scarps of individual landslide features, and the undulating ground at the base of the slope is the displaced material). This evidence of previous failures and the slope of the hillside indicates that the general area can be expected to be affected by hillside instability, and stability assessment should be undertaken before any further development works are undertaken.

25. Submitter 2 notes that half their dwelling and 1/3 of their property is within Area A. The report states that Area A has 'a characteristic angle of 45 degrees from the toe of the slope', which the land below our property and our sloping land simply does not have. The Submitter considers that the vast majority of the property and the downhill neighbours do not even fit into the flatter graded Area B, as defined by the grade 30-40 degrees. A check on pre-construction plans, dated 1962, of the D'Arcy Rd subdivision land shows the same lack of severe grade at this site, and no significant alteration to the slope has occurred. This shows that the land has not failed within the last 52 years. The application of and choice of grading applied to the property is incorrect.

Council's engineering consultant comments in response that:

Use has been made of gradient maps produced from the Council's terrain model; an extract of the map is produced in Figure 2 above. Using this and observations in the field and from aerial photographs we have attempted to classify the hillside slopes into one of three categories; Area A, Area B, or no classification. Where the character of the hillside is such that relict or more recent landslides can be identified, and the hillside are of the same or similar slopes we have applied the same Area to them. In the vicinity of the property the hillside slope is similar to that to the west (as can be seen in Figure 2, with the yellow and orange colours on the gradient map), while to the east of the property the slope reduces, seen in Figure 2 as the predominance of blue colours.

26. Submitter 2 asks: "Why should more than the Area B zone be proposed for our hillside land below our house and extending up to the plateau of the house site?"

Council's engineering consultant comments in response that:

The evidence of relict landslides on the hillside in the general area of the property, and the similar slope below the property to those areas, indicates that there may be a risk of instability that would require further investigation if future development was proposed at the property.

27. The Submitter asks that Council remove the proposed zone from their house footprint at 28 D'Arcy Rd. (ie about a 3m shift)

Council's engineering consultant comments in response that:

The Areas have been determined using a consistent methodology by observing relict landslide and other features in the field, and from aerial photographs and contour maps. This has attempted to identify the underlying stability of the land. The mapping was completed at a scale of 1:2,500, and the maps produced at a scale of 1:5,000. A 3 metre adjustment is below the level of accuracy of the maps.

7.11 Officer Recommendations

That Submissions 2, 3, 4, 5, 6 and 7 from Rowan and Rosemary McGregor, Mark and Gaylene Buckley, Mark Buckley, Christopher Heywood, C.C. and R.C. Ogle, and Russell Goudie are appreciated and have been considered but the remedies sought be **rejected.**

No amendments are recommended as a result of these submissions.