



Canterbury Earthquake Recovery Authority

To Minister of Finance
Minister for Canterbury Earthquake Recovery

Subject Initial Green Zones for the Port Hills

Date 2 September 2011

Action required For decision by Monday 5th September 2011

First Contact Rosalind Plimmer
Interim Manager Recovery Strategy, Planning & Policy

Withheld under section 9(2)(g)

- Note** Port Hills Geotechnical Group on behalf of the Christchurch City Council have completed assessments of damage to properties, lifelines and infrastructure, and identified areas at risk to geotechnical hazards.
- Note** EQC Land Damage Assessment Teams (LDAT) have completed rapid property-by-property land damage assessments.
- Note** information from both Port Hills Geotechnical Group and EQC LDAT teams has been combined in a conservative manner to identify initial Green Zones for the Port Hills.
- Note** any area or property with an identified life-safety risk or significant geotechnical hazard remains white, along with any areas of significant or extensive land damage.
- Note** all non-residential properties including schools and community facilities remain white.
- Note** the following approximate property numbers in the initial Green Zone, and those remaining in the White Zone within the Port Hills boundary (excluding the Diamond Harbour area):

Areas within Port Hills boundary as shown on Map A	Residential property count ¹
Green	9700
White	3700 ²

¹ These figures are based on valuation roll data and include both residential improved and residential vacant lots. Numbers are rounded to the nearest hundred.

² This figure is for residential properties within the Port Hills boundary shown in Appendix 1 Map A only, i.e. it excludes the Diamond Harbour Area and Banks Peninsula

- 7 **Note** Green Zone properties have suffered no significant land damage, and are not exposed to any identified geotechnical life-safety risks. However, some properties may have land damage that can be repaired on an individual basis as part of the normal EQC and insurance process.
- 8 **Note** the Green Zone may contain properties where the land repair costs exceed the EQC assessed land value.
- 9 **Note** within the Green Zone, some properties may require specific engineering design to comply with the Building Act and Building Code, Department of Building and Housing guidelines and or local council consent requirements.
- 10 **Note** within the initial Green Zone for the Port Hills there are *properties with section 124 notices issued to prohibit entry*. They have been issued because they have localised geotechnical hazards, the building poses a risk due to structural reasons, or the property is at risk from failure of other property or infrastructure. The change from White Zone to Green Zone *does not* change that status of these individual properties, and does not remove those "red sticker" notices.
- 11 **Agree** to either:
 - 11.1 **Wait** for further assessment and reports on the Port Hills before making any zoning decisions and announcements;
 - 11.2 **Announce** initial Green Zones for the Port Hills as shown in Appendix 1 Map A based on the information in this paper.

Announce/Wait
Minister of Finance

Announce/Wait
Minister for Canterbury Earthquake Recovery

- 12 **Note** further Green Zones are expected to be identified for the Port Hills rural residential areas, the Diamond Harbour area and Banks Peninsula next month.
- 13 **Note** the 3700 properties remaining within the Port Hills White Zone are subject to geotechnical hazards or significant land damage. The Christchurch City Council must make decisions regarding tolerable life-safety risk levels before assessment of options for remediation, re-occupation or retreat are considered for these properties.

Hon Bill English
Minister of Finance

Hon Gerry Brownlee
Minister for Canterbury Earthquake Recovery

Purpose of report

- 1 This report asks the Ministers of Finance and Canterbury Earthquake Recovery to decide whether or not to announce a new Green Zone in the Port Hills area.

Background

- 2 On 27 June 2011, Cabinet noted the issues on the Port Hills are of a different nature to the low-lying areas and could be addressed in a separate paper [CAB Min (11) 24/15 refers]. The Port Hills areas have not suffered the same type of area-wide land damage (namely thin-crust and lateral spreading). Cabinet also agreed to the definitions of four zones for residential properties across Christchurch City, Waimakariri and Selwyn Districts: Green, Orange, Red and White.
- 3 On Monday 11 July, Cabinet authorised the Minister of Finance and Minister for Canterbury Earthquake Authority to jointly decide areas of Canterbury land which can be zoned 'Green'. Green Zones are established where there are no significant issues which prevent rebuilding in these areas, based on current knowledge of seismic activity [CAB Min (11) 26/16 refers].
- 4 Area-wide land damage in the Port Hills is characterised by the following:
 - 4.1 rock fall risk;
 - 4.2 cliff collapse;
 - 4.3 debris inundation; and
 - 4.4 land movement (slipping and rifting).
- 5 Further significant damage has occurred as a result of the recent 13 June 2011 aftershocks and a number of areas have required reassessment by the Port Hills Geotechnical Group and Tonkin & Taylor.
- 6 The Port Hills are currently classified as a White Zone. The White Zone was defined as 'un-zoned', noting that the Port Hills required further mapping and assessment.
- 7 The key decisions for the recovery of the Port Hills are set out in the table below. A separate paper will describe the process, roles and responsibilities and timing in further detail.

Decision	Information required	Expected timing
Minister of Finance and Minister of CER approval of initial Green Zones for Port Hills	Combined hazard and land-damage maps from Tonkin and Taylor	Early September 2011
Christchurch City Council adoption of tolerable life-safety risk level	3 reports from GNS on: life-safety risk; rock fall; and cliff-collapse.	End of September 2011
Government, Council and EQC decisions on recovery and funding options	Report on recovery and funding options and potential business case to government	To be confirmed
Christchurch City Council commissions remediation works ³	Funding agreements reached between Council, EQC and government	To be confirmed

³ Emergency remediation works are currently underway on the Port Hills

- 8 It would be possible to wait for all these reports to be completed before making a decision on whether parts of the Port Hills can go Green. This paper sets out information for Ministers to determine if the zone change can be made now. This paper is based on geotechnical advice from Dr Jan Kupec in CERA's Land, Information and Building team.
- 9 This paper describes only the initial Green Zones for the Port Hills. Further Green Zones will be identified for rural residential areas of the Port Hills, the Diamond Harbour area and Banks Peninsula once more information is available.
- 10 Complete zoning of the Port Hills cannot be carried out until the process in the table at paragraph 7 is completed.

Geotechnical assessment work completed

Who has been involved?

- 11 The Port Hills Geotechnical Group (PHGG) comprises six geotechnical engineering companies and is led by the Christchurch City Council to collect and review data from geotechnical land damage arising from the earthquakes of 22 February and 13 June 2011 (and associated aftershocks).
- 12 The primary objective of the PHGG has been to provisionally assess geotechnical land damage to properties, lifelines and infrastructure from recent earthquakes and their aftershocks. The secondary objective was to identify areas that are at heightened risk from large-scale geotechnical land damage and to prepare mitigation measures to deal with the newly identified hazards.
- 13 GNS contributed to the definition of areas potentially exposed to geotechnical hazards.
- 14 The outcome from the work undertaken by PHGG to date is a geotechnical hazard map showing areas where properties, infrastructure and lifelines on the Port Hills were damaged from recent earthquakes and their aftershocks. These maps also show the PHGG assessment of areas with an increased risk from newly identified geotechnical hazards, as well as areas where there was no damage and areas where there is minor to very low risk from geotechnical hazards.
- 15 The information assessed was collected on behalf of Christchurch City Council (CCC) specifically to identify life safety issues and is a global (macro scale) rather than site-specific assessment. It complements but does not replace site specific residential property assessments undertaken by EQC for insurance purposes.
- 16 Site-specific residential assessments were undertaken by the EQC Land Damage Assessment Team (LDAT) to rapidly map land damage. The land damage categories applied to every residential property are; major cliff collapse resulting in land inundation, minor to severe land movement, land inundation from failed slopes, retaining wall failures, and no observed land damage. If any life-safety risks are observed, EQC and CCC are notified. Imminent risk as defined by the EQC Act is not specifically assessed in the rapid assessment stage of mapping except where life-safety risks may be identified as a consequence of the realisation of the risk. The outcome of this work is a land damage map on a property-by-property basis showing individual residential properties classified by land damage type.
- 17 As this mapping work has been completed on a micro scale, it is difficult to display on a single plan, due to scaling issues. Multiple large scale plans or electronic files are required to discern individual properties from one-another. In addition the information was collected for EQC insurance claim purposes and is on an individual property basis

and is subject to privacy restraints. The information is restricted for the use of earthquake recovery purposes and cannot be reproduced for public viewing. The information has been rigorously reviewed and interrogated.

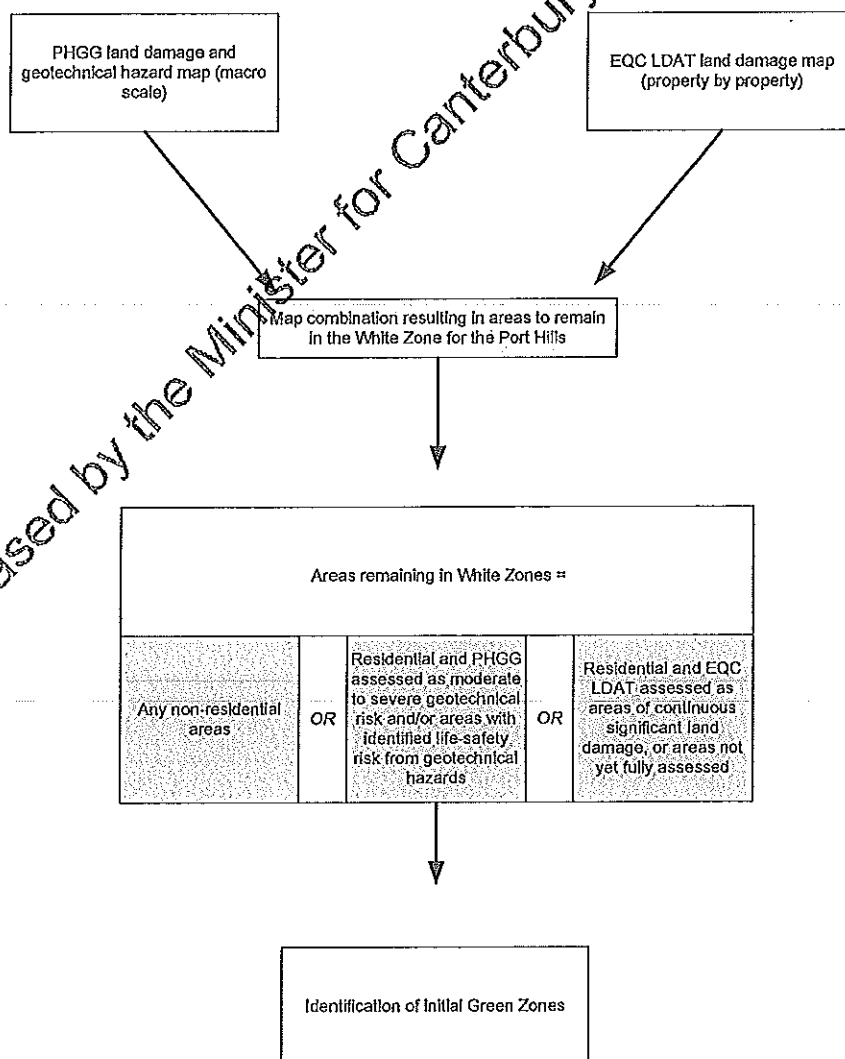
- 18 If an aftershock of magnitude greater than 5.5 occurs within in the Port Hills, or immediate surroundings, a complete reassessment of the Port Hills area would be required. The magnitude 4.9 aftershock on 2 September is not considered to affect the advice in this paper.

Process of peer-review

- 19 PHGG have internally peer-reviewed their methodology, from which the hazard maps are an output. The work completed by each of the PHGG sector groups was reviewed for consistency by a panel of all PHGG sector leaders. EQC LDAT information has been rigorously reviewed and interrogated.
- 20 PHGG and LDAT have met to review final zone boundaries. Slight adjustments were made to the final map to ensure consistency with cadastral parcel boundaries, to remove road lines and where the exclusion of a property made no sense. These changes were made on engineering judgement and logic.

Identification of initial Green Zones

- 21 The following diagram shows the process used for determining the initial green zones:



- 22 The land damage map from the PHGG prepared on the macro-scale hazards has been combined with the site-specific EQC LDAT residential land damage map by Tonkin and Taylor to produce one coherent and consistent map to allow decisions to be made regarding initial residential Green zone.
- 23 A **conservative approach** has been taken in identifying the areas **to remain in the White Zone**. Any area or property with an identified life-safety risk from any significant geotechnical hazard remains white, along with any areas of significant or extensive land damage. There are some areas that remain in the White Zone that may have only minor damage however are alongside areas of major/severe damage i.e. buffer zones. All non-residential properties including schools and community facilities remain white.
- 24 Hence, the **criteria for these residential Green Zones** are that both PHGG and EQC LDAT's green criteria must be met for a property to be identified as green. Any property that meets only one of the criteria remains white.

	Approximate residential property count ⁴
Green	9700
White	3700 ⁵

- 25 Appendix 1 Map A shows the initial residential Green Zone areas for the Port Hills. The area of the Port Hills included for assessment for initial residential Green Zones is contained within the Port Hills boundary shown on the map. White Zone areas inside and outside these boundaries require further assessment and analysis prior to rezoning.
- 26 All rural residential properties remain in the White Zone at this stage as they may not have been rapidly assessed and may have severe land damage.

What Green Zone means for residential property owners

- 27 Green Zone residential properties have no significant land issues that prevent rebuilding. Properties with land damage can be repaired on an individual basis as part of the normal EQC and insurance process. Any localised areas of more significant land damage (affecting one or more properties) in the Green Zone will be managed by the EQC and their specialists. The rezoned Green Zone properties have not been identified to be exposed to any known life-safety risks.
- 28 The Earthquake Commission Act entitles the homeowner to compensation for the insured value of the area of land that is actually lost or damaged or the cost to repair or reinstate (to a condition substantially the same but not better than the time prior to the event) the damaged land whichever is the lesser. The residential Green Zone may contain properties where the land repair costs exceed the EQC assessed land damage value. Some properties owners in Green Zones on the flat areas of Christchurch will also be in this situation. It is not possible to know how many property owners on the Port Hills will be in this situation until further detailed property-by-property assessments and analysis are undertaken on behalf of EQC.

⁴ These figures are based on valuation roll data and include both residential improved and residential vacant lots. Numbers are rounded to the nearest hundred.

⁵ This figure is for residential properties within the Port Hills boundary shown in Appendix 1 Map A only. i.e. it excludes the Diamond Harbour Area and Banks Peninsula

- 29 Within the residential Green Zone, some properties may require specific engineering design to comply with the Building Act and Building Code, Department of Building and Housing guidelines and or local council consent requirements. Decisions on when to commence rebuilding or repairs should take account of increase seismicity, potential for significant aftershocks and currently adopted seismic standards.
- 30 Both PHGG and LDAT teams consider more areas will be able to be identified as suitable for the residential Green Zone in the future once further investigation and assessment has been undertaken.

Section 124 notices under the Building Act (red stickered buildings)

- 31 Within the initial Green Zone for the Port Hills there are **properties with Section 124 notices issued to prohibit entry**. They have been issued because they have localised geotechnical hazards, the building poses a risk due to structural reasons, or the property is at risk from failure of other property or infrastructure. The change from White Zone to Green Zone does not change that status of these individual properties, and **does not remove those "red sticker" notices**. The CCC manages the process of issuing these notices and removal of them once the hazard no longer exists.

Areas remaining in White Zones

- 32 The following table outlines the process required for properties remaining within White Zones on the Port Hills and Banks Peninsula

White Zone	Approximate residential property count	Next steps	Expected timing
Diamond Harbour, Charteris Bay and Purau Bay	900	LDAT mapping has been recently completed. Digitisation of LDAT data required. Combination of LDAT data with PHGG data to allow identification of initial Green Zones for this area. Some areas may remain as White Zone.	October 2011
Rural residential within Port Hills White Zone boundary ⁶	120	Identification required in land use databases	October 2011
Commercial, parks and reserves and all other non-residential within Port Hills White Zone boundary ⁶	(Approx 1700 non-residential properties)	These will be re-zoned using a new category and legend issued with an updated zone map. This will be dealt with in a separate paper.	October 2011

⁶ The Port Hills White Zone boundary is shown in Appendix 1 Map A.

Banks Peninsula (excluding Diamond Harbour area)	Number to be confirmed early September	An interim process is being considered by Cabinet to expedite the rebuilding process for Banks Peninsula residents in the White Zone. Re-classification of the White Zone will occur once further assessment of geotechnical hazards is completed. CCC have commissioned a detailed research study into the geotechnical hazards present on Banks Peninsula	Rapid assessment occurring early September 2011
All remaining residential areas within Port Hills White Zone boundary ⁷	3700	CCC will adopt a level of tolerable life-safety risk, enabling decisions on which properties must be retreated from, which could be remediated and which could be reoccupied. CCC will report on recovery and funding options and potentially produce a business case to government. EQC to report on remediation options and funding. Funding agreements reached between Cabinet, CCC and EQC. Implement retreat and remediation. Re-classify remaining White Zones.	September 2011 onwards, a separate paper will cover this process.

Consultation

33 Treasury and the Ministry of Education have been consulted on this paper. The Department of the Prime Minister and Cabinet were informed of this paper.

Recommendations

34 It is recommended that you:

- 1 Note that the Port Hills Geotechnical Group on behalf of the Christchurch City Council have completed assessments of damage to properties, lifelines and infrastructure, and identified areas at risk to geotechnical hazards.
- 2 Note that EQC Land Damage Assessment Teams (LDAT) have completed rapid property-by-property land damage assessments.

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- 3 **Note** that information from both Port Hills Geotechnical Group and EQC LDAT teams has been combined in a conservative manner to identify initial Green Zones for the Port Hills.
- 4 **Note** any area or property with an identified life-safety risk or significant geotechnical hazard remains white, along with any areas of significant or extensive land damage.
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13 **Note** the 3700 properties remaining within the Port Hills White Zone are subject to geotechnical hazards or significant land damage and require decisions regarding tolerable life-safety risk levels before assessment of options for remediation, reoccupation or retreat are considered for these properties.



Rosalind Plimmer
Interim Manager Recovery Strategy, Planning & Policy
2 September 2011

Released by the Minister for Canterbury Earthquake Recovery