

31 May 2013

Hon Gerry Brownlee
Minister for Canterbury Earthquake Recovery
Parliament Buildings
WELLINGTON

Dear Minister Brownlee

In response to the list of queries received on 28 May 2013, please find attached:

- A table outlining the Group's response;
- Geotechnical information on 51 - 61 Heberden Avenue;
- Geotechnical information on 48 Main Road; and
- A document about life-safety risk modelling.

It has not been possible to convene a formal meeting of the full Advisory Group, however two Group members have worked through the list of properties and discussed this response.

Your office has advised that you would like to discuss these properties with me on Tuesday 4 June. I look forward to that meeting.

Yours sincerely



Keith Turner
CHAIR
PORT HILLS ADVISORY GROUP

Released by the Minister for Canterbury Earthquake Recovery

Released by the Minister for Canterbury Earthquake Recovery

Table 1: Port Hills Zoning Review Advisory Group: Supplementary Information Requested

	Address	Map	Area	Recommended zoning	Reasons as per Minutes supplied 5 April	Linkage to criteria	Guiding consideration	Additional information provided by the Advisory Group	Query/comment	Any further information to be provided by the Advisory Group?
1.	77A and 79 Bowenvale Ave	1	Bowenvale	77A: Remain green 79: Green > Red	77A: <i>No change recommended</i> 79: The geotechnical data shows that the dwelling on this property is exposed to an Annual Individual Fatality Risk of 1 in 10,000 or greater in 2016 due to rock roll as defined by GNS Science risk modelling.	<i>Not previously queried</i>	<i>Not previously queried</i>	<i>Not previously queried</i>	These properties appear to be used as one property with a shared access way and the same owners. Approximately the same proportion of each property is within the risk line for rock roll. Should 77A be recommended for rezoning red?	77A is a vacant residential lot. In applying the Port Hills zoning criteria to vacant residential lots the group exercised judgment in relation to lots intersected by the life safety risk line and applied a reasonableness test to achieve a sensible outcome. The Group does not recommend that 77A should be rezoned red.
2.	212A, and 214A & 214S Centaurus Rd	3	Centaurus Road	212A: Green > Red 214A & 214S: Remain green	212A: The geotechnical data shows that the dwelling on this property is exposed to an Annual Individual Fatality Risk of 1 in 10,000 or greater in 2016 due to rock roll as defined by GNS Science risk modelling. 214A and 214S: <i>No change recommended</i>	<i>Not previously queried</i>	<i>Not previously queried</i>	<i>Not previously queried</i>	These properties (two titles) share an access way and appear to be being used as one property. There are two cross-leased dwellings on one title (214A&S) as well as a secondary structure very close to or across the boundary of 212A. More than half of 214A&S is within the risk line for cliff collapse. Should 214A and 214S be recommended for rezoning red?	These properties have <i>three</i> titles. There are <i>two</i> cross leased flats in <i>one</i> building with <i>two</i> titles on the property labelled 214A and 214S. There may also be a secondary structure close to or across the boundary of 212A. There is a sleep out on 212A, directly beneath the cliff face. The Group visited this area. Expert advice provided to the Group indicated that the risk line between 214A/S and 216 is overstated. The area is a former quarry and the cliff is man-made. The area between the bottom of the cliff and the dwellings is a large flat area and this would have the effect of reducing the runout area of any potential cliff collapse debris. The Group does not recommend that 214A and 214S be rezoned red.
3.	323 Port Hills Road	5	Stronsay	Remain green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	All Crown and CCC land should be recommended for green zoning [5 Apr]	<i>See Guiding Consideration</i>	This property is owned by CCC. Property appears to be entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change? Should this property be recommended for rezoning red?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes. The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line. The Group does not recommend that this property be rezoned red.

Table 1: Port Hills Zoning Review Advisory Group: Supplementary Information Requested

	Address	Map	Area	Recommended zoning	Reasons as per Minutes supplied 5 April	Linkage to criteria	Guiding consideration	Additional information provided by the Advisory Group	Query/comment	Any further information to be provided by the Advisory Group?
4.	50 Avoca Valley Road	7	Avoca Valley	Remain green	<i>No change recommended</i>	The annual individual fatality risk associated with the residential dwelling is less than 1 in 10,000 at 2016 risk levels as per the GNS model.	<i>See additional information</i>	The dwelling on this property is outside the life safety risk line [5 Apr]	Significant proportion of the property is within the risk area. Surrounding properties are all zoned red. Should this property be recommended for rezoning red? Or is there a case for partial zoning of this property?	This Group does not recommend that this property be rezoned red because the dwelling on this property is outside the life safety risk line. The Group does not recommend partial zoning of this property.
5.	27 Morgans Valley	10	Morgans Valley	Rec: Red > Green	This property is owned by CCC	<i>See Guiding Consideration</i>	All Crown and CCC land be recommended for green zoning.	Crown and CCC land is generally recommended for green zoning. This property is not residential. This property provides access to 70A Morgans Valley (which is also owned by CCC). [10 May]	This property is owned by CCC. Property appears to be entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes (property is a legal access way to 70A Morgans Valley). The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.
6.	54 Morgans Valley	10	Morgans Valley	Rec: Red > Green	This property is owned by CCC	<i>See Guiding Consideration</i>	All Crown and CCC land be recommended for green zoning.	Crown and CCC land is generally recommended for green zoning. This property is not residential. This property provides access to 70A Morgans Valley (which is also owned by CCC). Expert advice provided to the Group indicated that the GNS model overstates the risk to this property as it doesn't sufficiently reflect variation in the local topography. This property partially sits on higher ground than the adjacent red-zoned property at 56 Morgans Valley. [10 May]	This property is owned by CCC. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change? Advisory Group has noted that the GNS model overstates the risk to this property. If the Group's reasonableness test was to be applied to this property in the same way as for vacant land, what would the Group's recommendation be?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes (property is a legal access way to 70A Morgans Valley). The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.

Released by the Minister for Canterbury Earthquake Recovery

Request by the Ministry for Canterbury Earthquake Recovery

Table 1: Port Hills Zoning Review Advisory Group: Supplementary Information Requested										
Address	Map	Area	Recommended zoning	Reasons as per Minutes supplied 5 April	Linkage to criteria	Guiding consideration	Additional information provided by the Advisory Group	Query/comment	Any further information to be provided by the Advisory Group?	
7. 70 Morgans Valley	10	Morgans Valley	Remain Green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	All Crown and CCC land be recommended for green zoning. [5 Apr]	<i>See Guiding Consideration</i>	This property is owned by CCC. Property appears to be entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes. The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.	
8. 70A Morgans Valley Road	10	Morgans Valley	Remain green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	Crown and CCC land generally recommended for green zoning as it is not residential.	This property is owned by CCC and is a large area of undeveloped land. [10 May]	This property is owned by CCC. A significant proportion of the property appears to be within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change? If the Group's reasonableness test was to be applied to this property in the same way as for vacant land, what would the Group's recommendation be? Is there a case for partial zoning of this property?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes. The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line. The Group does not recommend that this property be rezoned red.	
9. 87 Morgans Valley	10	Morgans Valley	Remain green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	In applying the Port Hills zoning criteria to vacant residential lots the Group exercised judgement in relation to lots intersected by the life safety risk line and applied a reasonableness test to achieve a sensible outcome.	This property is a large subdivision balance lot, used for rural activities. [5 Apr]	Property appears to be entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes (property is a large subdivision balance lot, used for rural activities). The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.	

Table 1: Port Hills Zoning Review Advisory Group: Supplementary Information Requested

	Address	Map	Area	Recommended zoning	Reasons as per Minutes supplied 5 April	Linkage to criteria	Guiding consideration	Additional information provided by the Advisory Group	Query/comment	Any further information to be provided by the Advisory Group?
10.	Parcels at rear of 136 and 136C Main Road	16	Redcliffs 1	Remain green	<i>No change recommended</i>	<i>See additional information</i>	Crown and CCC land generally recommended for green zoning as it is not residential.	These properties are part of Redcliffs School. The whole school is zoned green. [10 May]	This property is owned by the Crown. Rear parcels (and buildings) appear to be substantially within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	The Group recommended that this property remain zoned green in accordance with its guiding consideration that Crown and CCC land is generally recommended for green zoning. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.
11.	284R Main Road	19	Kinsey Terrace	Rec: red > green	The property at 284R Main Road Redcliffs is CCC owned	<i>See Guiding Consideration</i>	All Crown and CCC land be recommended for green zoning.[5 Apr]	<i>See Guiding Consideration</i>	This property is owned by CCC. Property appears to be substantially within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change? If the Group's reasonableness test was to be applied to this property in the same way as for vacant land, what would the Group's recommendation be?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes (property is used for water supply). The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.
12.	300 and 300A Main Road	19	Kinsey Terrace	Remain green	<i>No change recommended</i>	<i>Not previously queried</i>	<i>Not previously queried</i>	<i>Not previously queried</i>	This property is owned by CCC. Properties appear to be entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes. The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.

Release of the Minutes for Canterbury Earthquake Recovery

Requested by the Minister for Canterbury Earthquake Recovery

Table 1: Port Hills Zoning Review Advisory Group: Supplementary Information Requested										
Address	Map	Area	Recommended zoning	Reasons as per Minutes supplied 5 April	Linkage to criteria	Guiding consideration	Additional information provided by the Advisory Group	Query/comment	Any further information to be provided by the Advisory Group?	
13. 72 Wakefield Ave	21	Wakefield 1	Remain green	<i>No change recommended</i>	<i>Not previously queried</i>	<i>Not previously queried</i>	<i>Not previously queried</i>	<i>Not previously queried</i>	This property is owned by CCC. Property appears to be entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes. The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.
14. 100A Wakefield Ave	22	Wakefield 2	Remain green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	All Crown and CCC land should be recommended for green zoning. [5 Apr]	<i>See Guiding Consideration</i>	This property is owned by CCC. Property appears to be entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes (property provides access to Captain Thomas track). The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.	
15. 69 Evans Pass Road (note property is not 69 Ocean View Terrace, as initially thought)	23	Sumnervale	Remain green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	All Crown and CCC land should be recommended for green zoning.[5 Apr]	<i>See Guiding Consideration</i>	This property is owned by CCC. Property appears to be more than half within the risk line, and is surrounded by red zone properties. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change? If the Group's reasonableness test was to be applied to this property in the same way as for vacant land, what would the Group's recommendation be?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes (property is a water tank). The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.	

Released by the Minister for Canterbury Earthquake Recovery

Table 1: Port Hills Zoning Review Advisory Group: Supplementary Information Requested

	Address	Map	Area	Recommended zoning	Reasons as per Minutes supplied 5 April	Linkage to criteria	Guiding consideration	Additional information provided by the Advisory Group	Query/comment	Any further information to be provided by the Advisory Group?
16.	51 – 61 Heberden Ave (odd numbers)	24	Heberden 1	Remain green	<i>No change recommended</i>	There is not the potential for immediate cliff collapse or land slip as assessed by GNS caused or accentuated by the Canterbury earthquakes with associated risk to life.	See additional information	Expert advice provided to the Group indicates that the GNS model overstates the life safety risk to this property and that the cliffs and lower slopes in this area are man-made and they performed well in the numerous earthquakes.	Would like to discuss the risk profile in relation to these properties	Expert geotechnical advice provided to the Group indicates that the GNS model overstates the life safety risk to these properties. The cliffs and lower slopes in this area are man-made, and in some cases are slopes or limited bluffs rather than cliffs. They have performed well in the numerous earthquakes. The area has been subject to intense geotechnical scrutiny. The Group agreed that the properties did not meet the criterion of potential for immediate cliff collapse or land slip with associated risk to life. Please see accompanying geotechnical information received by the Group.
17.	5 Awaroa Lane	24	Heberden 1	Remain green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	In applying the Port Hills zoning criteria to vacant residential lots the Group exercised judgement in relation to lots intersected by the life safety risk line and applied a reasonableness test to achieve a sensible outcome.	This property is a large subdivision balance lot, used for rural activities. [5 Apr]	Property appears to be entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes (property is a large subdivision balance lot, used for rural activities). The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.
18.	3 Heberden Ave and 4 Scarborough Rd (adjoining properties)	25	Heberden 2	Remain green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	All Crown and CCC land should be recommended for green-zoning. [5 Apr]	<i>See Guiding Consideration</i>	This property is owned by CCC. Properties appear to be entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes. The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.

Released by the Minister for Canterbury Earthquake Recovery

Table 1: Port Hills Zoning Review Advisory Group: Supplementary Information Requested

	Address	Map	Area	Recommended zoning	Reasons as per Minutes supplied 5 April	Linkage to criteria	Guiding consideration	Additional information provided by the Advisory Group	Query/comment	Any further information to be provided by the Advisory Group?
19.	21 and 23 Heberden Ave	25	Heberden 2	Remain green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	All Crown and CCC land should be recommended for green zoning. [5 Apr]	<i>See Guiding Consideration</i>	This property is owned by CCC. Properties appear to be entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes. The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.
20.	23A Ross Terrace	34	Hawkhurst Road	Remain green	<i>No change recommended</i>	<i>See additional information</i>	<i>See additional information</i>	This is a small piece of vacant land (144 m2). The property has its own title but appears to be treated as being associated with 25 Ross Parade. Both titles are currently owned by the same individual. The north-western boundary of 23A is undeveloped land and not a formed road, although it appears that it may still be legal road. [5 Apr]	Property appears to be entirely within the risk line. Despite the fact that 23A and 25 Ross Terrace have the same owner they have individual titles and could be on sold separately. Should this property be recommended for rezoning red?	The Group does not recommend rezoning this property red.

Table 1: Port Hills Zoning Review Advisory Group: Supplementary Information Requested

	Address	Map	Area	Recommended zoning	Reasons as per Minutes supplied 5 April	Linkage to criteria	Guiding consideration	Additional information provided by the Advisory Group	Query/comment	Any further information to be provided by the Advisory Group?
21.	73 Hawkhurst Road	34	Hawkhurst Road	Part green and part red (no changes recommended)	The property located at 73 Hawkhurst Road (being the portion of Part RS 266 having the area of 0.4046 hectares more or less, contained in certificate of title CB2C/1236) is exposed to an Annual Individual Fatality Risk of 1 in 10,000 or greater in 2016 due to rock roll as defined by GNS Science risk modelling.	See additional information	See additional information	<p>This is a large property in one title comprising three lots. The lot containing the dwelling is zoned red; the remaining lots are zoned green.</p> <p>The Group has recommended that the zonings remain unchanged, contingent on a separate certificate of title being issued for the green zoned lots. A separation enables an offer to be made for the residential portion on this title</p>	<p>The large rural parcel of the title is substantially within the risk lines and makes up part of a residential property. Query whether there is a strong case for subdivision.</p> <p>Should this property be recommended for rezoning red?</p>	The Group recommends that the zonings remain unchanged, contingent on a separate certificate of title being issued for the green zoned lots.
22.	460 Governors Bay Road	40	Governors Bay Road	Remain green	No change recommended	See Guiding Consideration	Properties that are zoned rural under CCC's City Plan and the Banks Peninsula District Plan are generally recommended for green zoning. Rural properties have been recommended for red zoning where they are included in the GNS Science rock roll or cliff collapse models, are part of the residential settlement pattern for the area, have met the red zoning criteria, and the Group has applied its guiding considerations in a consistent manner. [5 April]	See Guiding Consideration	<p>The properties at 460 and 479 Governors Bay Road have the same owners and are used as a single property despite there being a road between the two.</p> <p>460 Governors Bay is substantially within the rockfall risk area and part of the residential settlement pattern for the area.</p> <p>Should this property be recommended for rezoning red?</p>	460 Governors Bay Road is a large lot that is used for rural activities. The Group did not consider 460 to be part of the residential settlement pattern. The Group does not recommend rezoning this property red.

Released by the Minister for Canterbury

Withheld under section 9(2)(a)

Withheld under section 9(2)(a)

Table 1: Port Hills Zoning Review Advisory Group: Supplementary Information Requested

	Address	Map	Area	Recommended zoning	Reasons as per Minutes supplied 5 April	Linkage to criteria	Guiding consideration	Additional information provided by the Advisory Group	Query/comment	Any further information to be provided by the Advisory Group?
23.	522 Governors Bay Road	41	Maori Gardens	Remain green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	Crown and CCC land is generally recommended for green zoning. This property is not residential. [10 May]	This property is owned by CCC.	Property appears to be almost entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	This property is owned by CCC. This property sits within an area zoned residential under the District Plan, but is not used for residential purposes (property is a water tank). The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.
24.	9 Leading Light Lane	43	Leading Light Lane	Remain green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	In applying the Port Hills zoning criteria to vacant residential lots the Group exercised judgement in relation to lots intersected by the life safety risk line and applied a reasonableness test to achieve a sensible outcome.	This property is a large subdivision balance lot comprising vacant land. [5 Apr]	Property is vacant. Property appears to be almost entirely within the risk line. Property is zoned residential and shouldn't zoning reflect level of risk, regardless of ownership or use which may change?	This property sits within an area zoned residential under the District Plan, but is not used for residential purposes (property is a large subdivision balance lot, used for rural activities). The GNS modelling assumes residential use and is therefore considered to overstate the life safety risk associated with this property. The Group did not consider the question of future changes in ownership and considered future changes in use only in relation to privately owned vacant residential lots intersected by the life safety risk line.
25	48 Main Rd (access from Crystalwood Lane)	43	Leading Light Lane	Remain green	<i>No change recommended</i>	<i>See Guiding Consideration</i>	In applying the Port Hills zoning criteria to vacant residential lots the Group exercised judgement in relation to lots intersected by the life safety risk line and applied a reasonableness test to achieve a sensible outcome.	Expert advice provided to the Group by GNS indicated that, based on the field verification team's observations and the position of the section on the boundary of the rockfall risk model, it is likely that the risk to this property is overstated (the GNS model, like all numerical models, becomes less certain at the edges of the modelled area due to inherent model assumptions and mathematical constraints).	Would like to discuss the risk profile in relation to this properties	Expert advice provided to the Group by GNS indicated that, based on the field verification team's observations and the position of the section on the boundary of the rockfall risk model, it is likely that the risk to this property is overstated (the GNS model, like all numerical models, becomes less certain at the edges of the modelled area due to inherent model assumptions and mathematical constraints). Please see accompanying geotechnical information received by the Group.

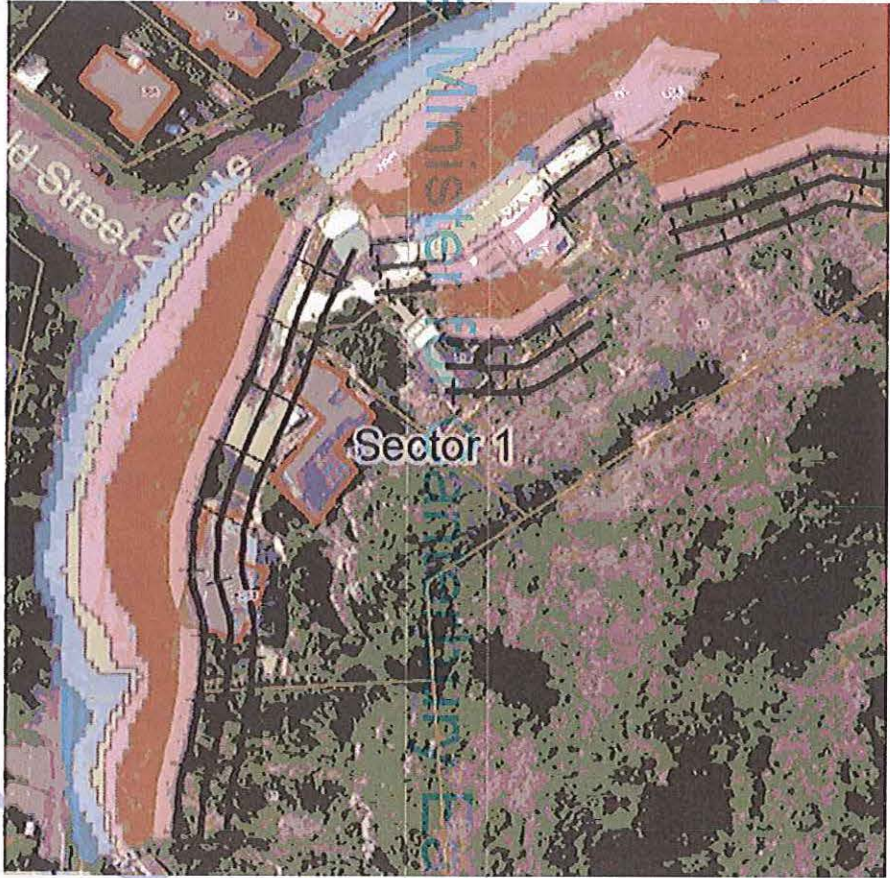
Released by the Minister for Canterbury Earthquake Recovery

Table 1: Port Hills Zoning Review Advisory Group: Supplementary Information Requested

	Address	Map	Area	Recommended zoning	Reasons as per Minutes supplied 5 April	Linkage to criteria	Guiding consideration	Additional information provided by the Advisory Group	Query/comment	Any further information to be provided by the Advisory Group?
26	301 Port Hills Road – storage units	6	Port Hills Road	Rec: green > red	This property is exposed to an Annual Individual Fatality Risk of 1 in 10,000 or greater in 2016 due to rock roll as defined by GNS Science risk modelling.	Not previously queried	Not previously queried	Not previously queried	Should this property be recommended for rezoning green?	The Group has applied its guiding consideration: Commercial properties where the buildings were within or substantially intersected by the 1 in 10,000 2016 AIFR line typically have been recommended for red zoning. The Group does not recommend that this property is rezoned green.

Area 1: 51, 51A, 51B and 51C to 1/55 and 2/55 and 61 Heberden Avenue (see picture below).

The panel noted No.'s 45 and 49 Heberden Avenue have Section 124 (s124s) notices on them yet 51, 51A, 51B and 51C to 1/55 and 2/55 and 61 Heberden Avenue do not but these latter properties do sit well within the GNS debris inundation and EQ retreat lines for this cliff area. The absence of s124s on these latter properties suggests that the PHGG believe there to be no immediate life risk – which seems in conflict with the GNS risk model. Dr Kupec made a comment about this specific area to the Panel on Monday 26 Nov, but I would be grateful for brief written confirmation by PHGG, GNS and Dr Kupec on the geotechnical aspects of this area.



CERA Geotechnical Advisor's (Dr Kupec) comments:

I lived at No. 51c for 3 months prior to the EQ series and therefore I am very familiar with this immediate area. All sites are currently green zoned. Man-made cliffs are at the bottom at Heberden Avenue (Ave) and cuts for house sites above. The area is subject to $>10^{-4}$ AIFR from rockfall. Upper cliffs at No.'s 51, 51A, 51B, 51C and 1/55 and 2/55 were modified during residential dwelling construction. At No. 51B limited soil nailing has been undertaken. At No. 51C the cliff is the platform formed to construct the house and GNS model may not be representative. No. 61 is vacant. No damage experienced in the entire area. It is believed that the GNS model may not be representative as these are man-made steep slopes. The lower cliff at No. 61 is only few metres high. At No. 61 there is also an upper cliff outcrop, but

Released under the Ministerial Earthquake Recovery

at limited height referred to as a bluff, similar to the other properties in this group but in this case has not been modified by residential dwelling construction. The area was walked over by several geotechs including myself. No zoning review requests are noted.

PHGG's comments:

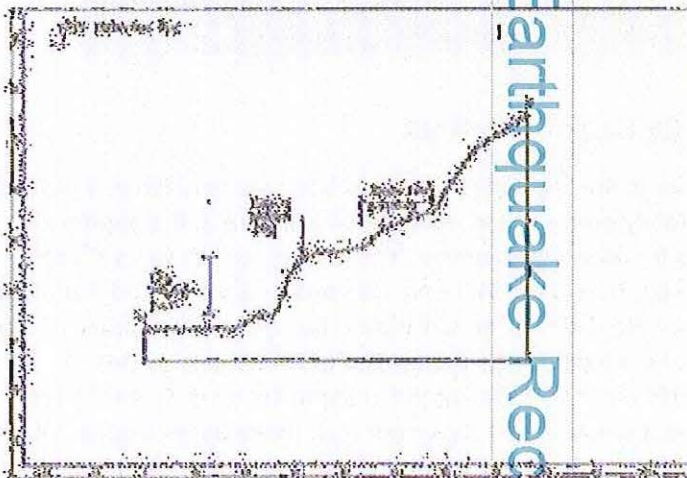
We have crawled over this slope on several occasions and found no justification for recommending s124 Notices on these dwellings.

We are aware that the slopes were scaled prior to construction of the houses, and this seems to have largely prevented rockfall in this area as a result of the earthquakes. The hazard in this area was managed before the earthquakes; it has been "well-tested" and it has performed well, with only 1-2 observed rockfalls (from the same source) in the June earthquake. Many of the rocks that can be seen in the photos of this area are boulders well-embedded in loess and do not represent viable source rock.

The slope including 51, 51A, 51B and 51C is a steep slope with areas of steep outcrop, not a cliff, so the event lines here are misleading (CERA comment – see PHGG cross sections below). Above 51B Heberden Ave the slope is c. 45 degree (i.e. not a cliff) and the bend back over the house of the event lines is not correct. We believe that the risk is less than suggested by the model.

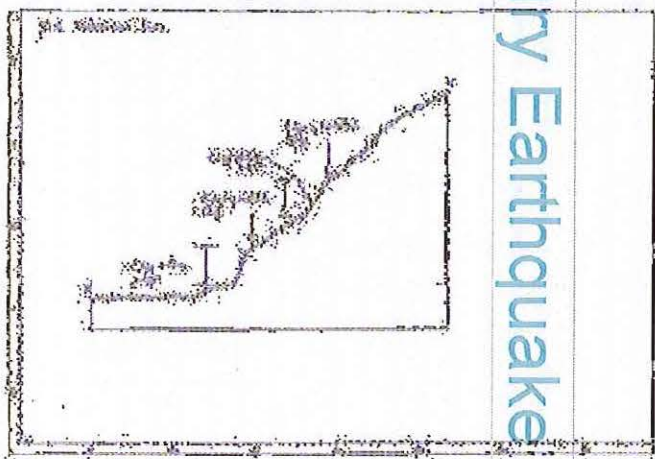
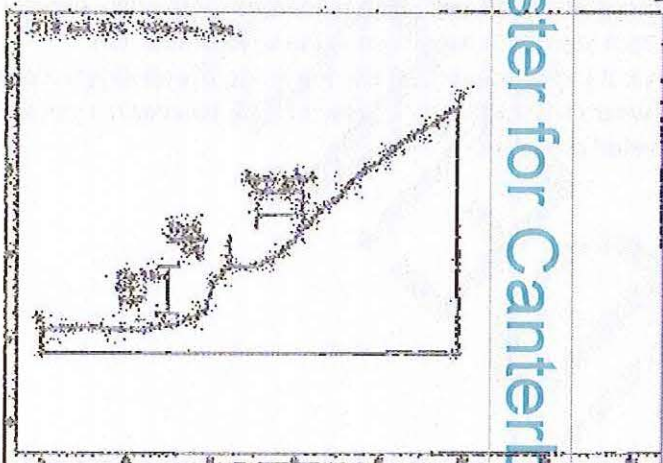
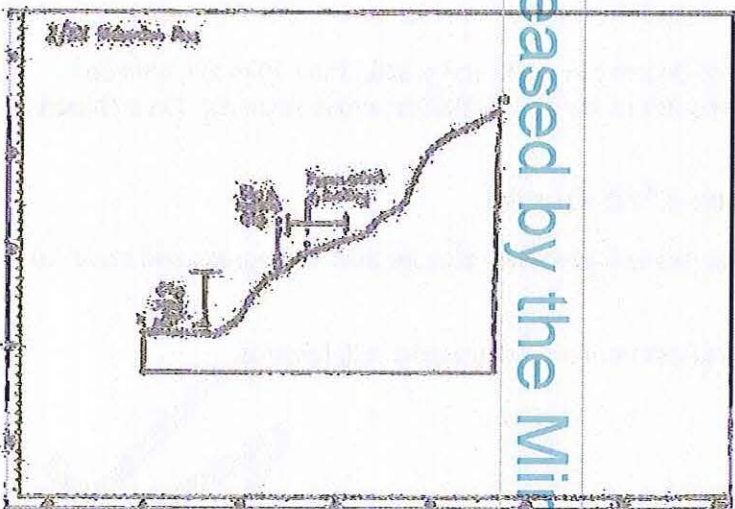
The cliff below the houses is about 10 m high and is on the borderline of cliffs that have been included in the model. No rockfall was observed from the cliffs below the houses. We note that both 1/55 and 2/55 are just touched by or behind the first EQ event line and that there has been no rockfall from the slopes below these dwellings.

The boulder roll source for this area is notably less than the suburb average model. The source is distributed in two distinct areas – high on the slope (about RL 100, toe of GNS source) and a lower source upslope of the houses; both are considered discontinuous minor to intermittent sources. The greatest risk to the houses is considered to be from the lower source; however, this area was scaled prior to construction of the houses.



Released by the Minister for Canterbury Earthquake Recovery

7/1/11



GNS comments:

The cliffs in these areas are > 45 degrees in angle and greater than 10 m in height and therefore correctly included in the risk models (see attached cross sections). On a property specific basis:

1/55 Heberden Ave, is behind the 2nd EQ event line.

The slope above 51B Heberden Ave is only slightly steeper than 45 degrees and about 10 m is its maximum height.

All of these properties are also at risk from rockfall (boulder roll) hazards.

CERA Site Summary

The cliffs and lower slopes are man-made in this area (and in some cases are slopes or limited bluffs rather than cliffs) and they performed well in the numerous earthquake events. It is questionable whether this area should in fact be included in the GNS study. On balance, given they are included, it would appear the GNS risk maps are overstating the risk to properties in this area apart from where s124s have been issued. The boulder roll risk at the properties is not in the GNS elevated risk zone.

CONFIDENTIAL

Geotechnical advice: 48 Main Road (access from Chrystalwood Lane)

Map 43

Received from Jan Kupec, CERA, 22 March 2013

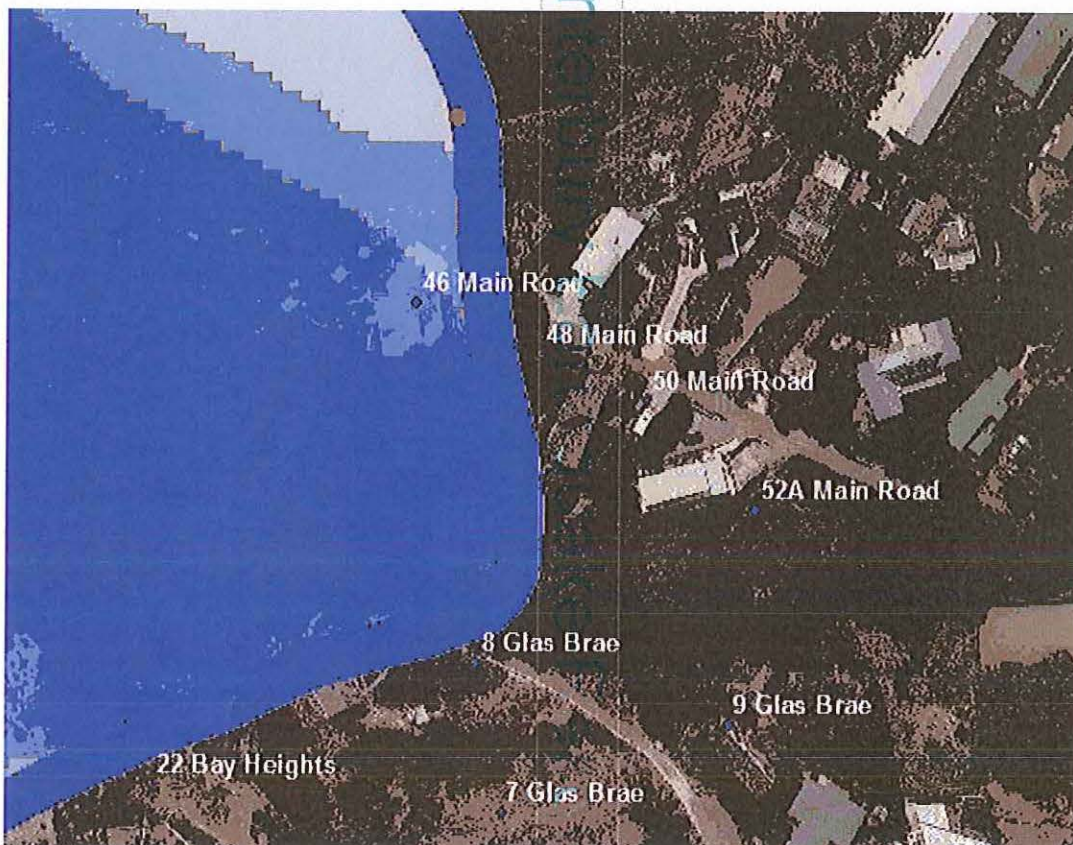
48 Chrystalwood Lane (Vacant)

Due to topographical constraints and boundary effects the rockfall risk may be overstated. However, this area has not been 'tested' by the EQ series as the PGA [Peak Ground Accelerations] were much lower than in the eastern extent of the port hills. The section is topographically elevated above the valley bottom which will provide a degree of protection. Conversely there were rocks on the subdivision to the north. There is dense vegetation at the valley bottom that although not considered would provide additional protection if it remains in place. Further advice was sought from GNS on this area.

Received from Chris Massey, GNS, 25 March 2013

Assuming the address is 48 Main Road - Based on the field verification work the risk at 48 Main Road was identified as being "less than GNS" by the field teams, as the section was located below (down slope) of the 10-6 AIFR risk line, and therefore outside the assessed limit of rockfall runout. The field teams also noted that "property is below the rockfall limit line, gully diverts boulders to the south of the section". However, parts of the section DO appear to be intersected by the rockfall limit line, but based on the field teams observations and the position of the section on the boundary of the rockfall risk model, it is likely that the risk is overstated at this location.

Although not considered in the rockfall risk model, there does appear to be evidence of past debris flow deposits in this area, suggesting debris flows made it as far down slope as these locations (discussed above).



Released under the Official Information Act 1982

ery

