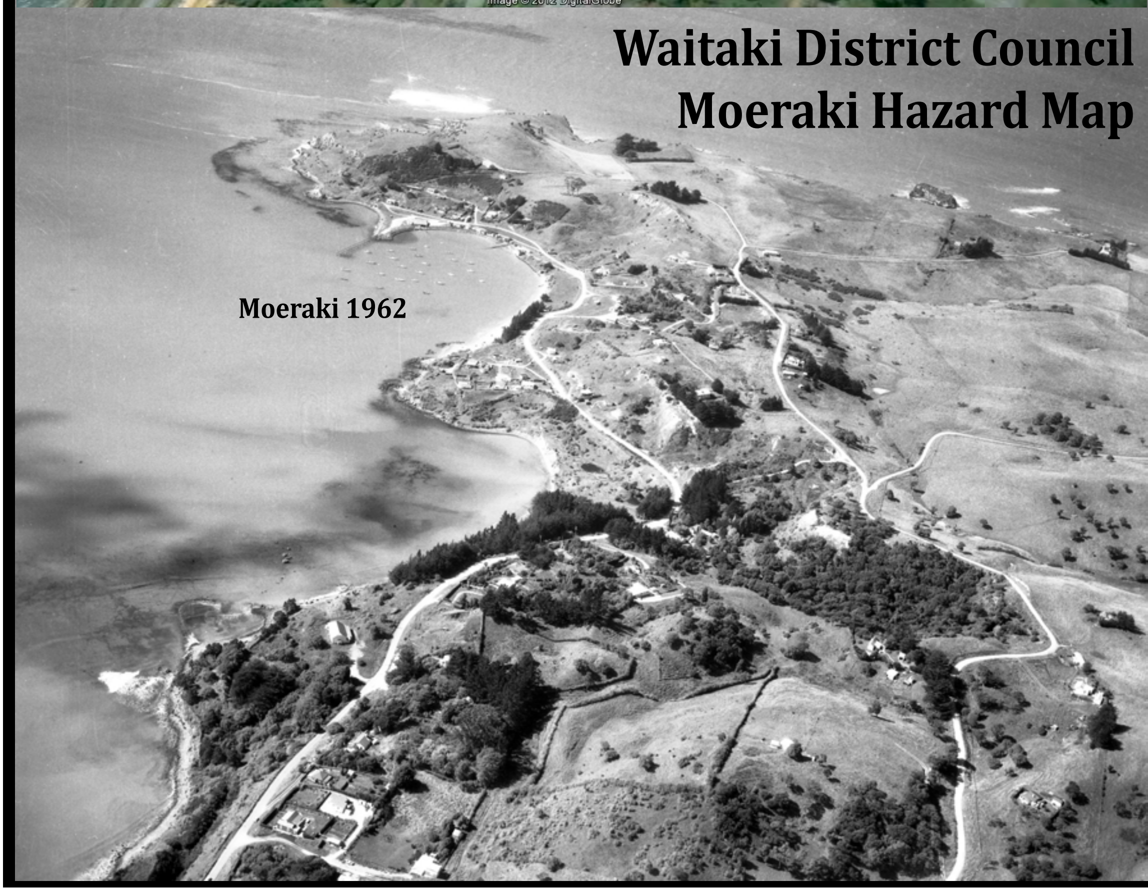
Waitaki District Council
Moeraki Hazard Map



Tonkin & Taylor

A report prepared for the Waitaki District Council
Tonkin and Taylor Ltd
May 2012

REPORT

Waitaki District Council

Moeraki Hazard Map

Report prepared for:

Waitaki District Council

Report prepared by:

Tonkin & Taylor Ltd

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May 2012

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Executive summary

This study consisted of collation of existing hazard data and fieldwork to update and convert to electronic form the existing WDC Hazard Map. The primary purpose of the report is to produce a set of maps to guide planning policy and data for use within Waitaki District Council's GIS system in a form that could be readily updated as further information becomes available.

The study scope is to provide sufficient information to guide the decision process for the consideration of resource consents and building consents. Because of the complexity of the physical environment within the slips at Moeraki and the need for consideration of each site and each proposed development in that context, a high level of detail is not included in the landslip hazard map. The landslip hazard map only needs to be sufficient to identify the level of further information required to be submitted to council for any development proposal within the Hazard Areas before consent may be granted.

The primary sources of data were:

- Field mapping
- High resolution geo-referenced colour aerial photography provided by WDC
- Topological contour data provided by WDC and also gathered for previous site investigations
- GNS QMAP
- Local knowledge and experience of senior geologists and information available from previous site investigations
- University of Canterbury engineering geology thesis by Michael Molineaux
- Former landslip risk map produced for WDCC by Tonkin & Taylor Ltd

The data is presented as AutoCAD DWG files and ArcView SHP shape files are also provided for the layers containing defined hazard areas.

The following layers are included:

- Topographic contours
- Combined high resolution aerial photography
- Geological hazard areas with classification
- Cadastral information including lot boundaries and roads

This report is based substantially on information gathered through investigations funded by the Earthquake Commission (EQC). These investigations have been primarily undertaken to define matters that impact upon the interests and responsibilities of the funding agency. This scope includes the identification of the extent of the landslip affected area and investigation of the relative extent of effects on individual properties.

Deformation monitoring and immediate mitigation in critical areas has been implemented in the form of surface water control and localised subsurface drainage as these are the measures which improve stability at minimal cost. There is also the potential for further stabilising measures in the form of widespread subsurface drainage if budget is available.

1 Conclusions

1. The primary hazard at Moeraki is slope instability caused by large slowly creeping landslips in mudstone which in some parts pose a high risk of damage to structures.

2. The Moeraki area has been mapped in terms of landslip risk, with five categories ranging from Very Low Risk to Very High Risk.

3. The moderate to high risk areas do not preclude the erection of new buildings but each will require a site evaluation, appropriate design and construction based on the advice of a certified geotechnical practitioner. If approved, new developments will be issued subject to caveats on property titles unders72 & 73 of the Building Act, so that any prospective future owners can be made aware of the landslip hazard. The implication of this is that there is unlikely to be any EQC cover for landslip damage under the Third Schedule of the EQC Act. 2003.

4. The level of detail of the high and very high risk area mapping is coarse. There will be some localised areas of very high risk within the high risk areas and these can only be accurately determined by a site inspection.

5. In the low risk areas, titles free of any s73 notice for landslip may be available subject to a favourable geotechnical report.

6. In the very low risk area, title free of s73 notice would be applicable as normal for unaffected land.

7. The landslip is highly sensitive to any increase in ground water. Any action which risks increasing ground water flows or ground water pressure will be harmful to slip stability and any action that removes groundwater or removes or diverts surface water from the slip area will reduce the risk of significant movement.

2 Recommendations

"These recommendations are proposed to

- Ensure that Waitaki District Council is informed of the extent of hazards present within the Moeraki Landslip area so that it may carry out its duties under the RMA and the Building Act.
- Ensure that the future development of Moeraki occurs in a manner that minimises risk to property from the hazards in the area
- Ensure that in the Moeraki Township, as many properties as possible have access to EQC insurance coverage and that property owners, insurers and mortgage lenders are fully informed of the extent of risk and of all mitigating factors that could be applicable to individual properties.
- Inform Waitaki District Council in its consideration of how it may address the geological processes occurring at Moeraki to avoid or mitigate hazard risk.

2.1 For Immediate Action

1. All future building consents within the areas on the Hazard Map (Appendix A Figure A1) shown in Orange (Moderate Risk) and Red (High Risk) are to be issued pursuant to a site engineering report that identifies a building site and building style that appropriately manages the risk of damage resulting from the landslip hazard and should be subject to s72-73 of the Building Act.
2. Building in the Very High Risk Areas (shown in Purple on the Hazard Map) should be a prohibited activity (or non-complying at least) for all structures other than minor essential elements of public infrastructure.
3. That any water that is captured on any hard surface within Moderate, High and Very High Risk areas (coloured Orange, Red or Purple on the Hazard Map) is disposed of in accordance with the advice of an engineer or at the direction of Waitaki District Council and in a manner that will not cause or exacerbate unstable ground conditions.
4. That any pond or any area that may retain or detain surface runoff water within the identified risk area (delineated by blue line as the catchment boundary in Appendix A Figure 1) is lined with an impermeable lining material and is designed and certified by geotechnical practitioner. As consequence all existing unlined ponds should be eliminated from within the designated catchment area.
5. That any crossing of any water course or drainage path within the landslip area be piped to a standard that will allow a 1:100 rain event to pass unimpeded.
6. That any watercourse or surface drainage channel within the landslip area is kept clear of sediment and excessive vegetation and a positive gradient is maintained throughout to enable efficient surface drainage.

7. Existing disposals of stormwater (or any other waste water) onto or into land within the landslip catchment is likely to exacerbate existing slips. It is recommended that all existing discharges within the landslip catchment address this issue as soon as legally possible, and to prohibit any new injection of water into the ground.
8. All existing stormwater should be piped or channelled either by a piped carrier drainage network or in a council maintained open channel off the entire catchment as soon as practicable.
9. Any perforated drain pipe or drain tile needs to be contained in a sealed channel or otherwise designed to ensure the drain removes water from the catchment.

2.2 For further consideration

- Further investigations should be undertaken to identify sources of groundwater recharge and ground water flows within and into the slip particularly during periods of high rainfall so that these can be reduced or removed from the landslip area.
- Investigations of the wider geology of the landslip, particularly at the mid and higher levels be undertaken for the purpose of identifying and evaluating possible mitigation or stabilising works which may include diverting or removing water from within the landslip and from the area at the head of the landslip.
- Options for continuous monitoring of the slip area, particularly the most at risk areas should be investigated, both to provide early warning of anomalous behaviour within the slip and also to provide both baseline information on landslip dynamics and performance monitoring of any remediation or mitigation work that may be implemented.
- Waitaki District Council and the Earthquake Commission should meet to discuss response options to the current and future issues of management of the effects of the landslip on the community of Moeraki.

3 Introduction

This report presents the results from a hazard mapping study of Moeraki and the surrounding area carried out by Tonkin & Taylor Ltd. It also provides some considerations for responding to the issues and recommendations for further investigations.

3.1 Scope of Work

The study covered Moeraki and surrounding areas, and principally draws on a report (Tonkin & Taylor Ltd, 2011) prepared for the Earthquake Commission (EQC) which should be read in conjunction with this report. A copy of the current draft of the EQC report is included in digital form in the attachments to this report. The EQC Report contains more detailed mapping than is included in this report as the EQC study was carried out for the purpose of investigating the effects on existing properties. The Draft Report to EQC is included in the electronic documentation in Attachment B.

3.1.1 Purpose of the report

The purpose of the study is to provide Waitaki District Council with guidance as to regulatory controls that are required on land to protect the interests of the Council, the community and individual landowners from the risks associated with development on unstable land.

This purpose does not require the higher resolution information supplied to EQC. What is necessary in this report is the identification of areas where greater case by case assessment of risk will be required for the conduct of a specific activity.

The report also provides guidance on recommended immediate actions for reducing or mitigating risk and also provides indications of possible future considerations for reducing hazard to the community and for possible community-wide mitigation works.

3.1.2 Summary of previous work

In 1982, Tonkin and Taylor Ltd prepared a report on landslip risk at Moeraki for the then Waitaki County Council. It contains a map showing landslip risk areas, ranging from very slight – severe risk. Land management criteria for each area are discussed.

A student from Canterbury University subsequently produced a master's thesis on Moeraki instability (Moeraki Township: Instability Assessment, M. K. Molineaux, 1983). It contains engineering geological maps that outline geology, drainage paths, and the extent and activity of mass movement areas. There is also a section on the geotechnical properties of the materials prone to instability, and an assessment of movement susceptibility for the township.

In early 2010, the engineering consultants to Waitaki District Council, GHD Ltd, advanced a proposal for stabilisation of localised active slips affecting the serviceability of Haven St, adjacent to and east of the Davids St intersection. This essentially involved improvement of surface drainage.

3.2 History of Movement

The Moeraki area has an extensive history of landslip since it was settled in 1836. It was reported that "heavy traffic and constant slips made upkeep of the road very expensive", and by May 1875 the road was described as "nearly impassable". In 1878 the rail link viaduct piles had moved seaward 1.2 m (suggesting a movement rate at that time averaging about 300 mm/year), and by 1879 the line had to be disestablished.

Continuing on to the present day there have been major stability problems with Haven Street, the main road along the peninsula. In addition, ground movements after rainfall events have regularly damaged houses and properties in the area.

4 Topography

4.1 Geomorphology

Aerial photos were used to interpret the geomorphology of the area. These included a series of 1947 stereo-pair photos from New Zealand Aerial Mapping, (1355/25-28 Moeraki run S146/18-4-47), more recent colour stereo-pairs SN 30008 flown in 2002 and a recent set of colour aerial photos supplied by the Otago Regional Council (ORC).The ORC images have been used to map the fresh scarps and geomorphology. LiDAR contour data have been supplied by the ORC, and used to help interpret the geomorphic features.

Marine maps have been obtained covering the sea bed area adjacent to the landslips. This shows a gently sloping (10 degrees or flatter) submarine profile extending offshore, with no channel features.

The geomorphology of the Moeraki coast is primarily governed by the volcanics, which form a series of headlands along the northern coast. The weak mudstones have been preferentially eroded to form a series of bays. Each of the bays spans approximately 300-400 m and has been eroded about 200 m inland. Cliffs along the coast range from 10-30 m in height.

Inland from the coast, a prominent scarp or scarp system up to 20 m high can be traced westwards from the Moeraki Wharf. In the area between the Moeraki Wharf and a point 100 m east of Davids St, the strip between the main scarp and the coast is typically 100-200m wide. The land is moderately to gently sloping, with numerous landslip features such as minor scarps and hummocky topography.

To the west lies a large landslip complex (the Tenby St Landslip) about 900m wide that extends about 600 m back from the coast. This includes the region where large-scale landslip activity occurred following the late May 2010 rainfall event. Movement was initially discovered affecting houses along the section of Haven St between Davids St and the Glamorgan St area, and the feature was termed the Davids-Glamorgan St Landslip.

The geomorphology of the area is characterised by large, rotated blocks of mudstone, typically hundreds of metres in lateral dimensions, with prominent scarps 10-20 m high. East-west trending gullies follow grabens (tensile zones encompassed by conjugate failure surfaces) between the blocks, and there are also several north-south trending gullies running towards the coast. Minor scarps, hummocky topography and landslip ponds are widespread.

4.2 Surface Drainage

There are few streams that are not ephemeral in the Moeraki area, which is probably related to the highly fractured nature of the mudstone and volcanics, and the dislocated topography due to landslip, which has produced hollows that tend to pond runoff. A number of these ponds have been mapped within the Davids-Glamorgan St Landslip. Further details regarding this and other elements of the work undertaken for EQC are available through the report to that agency.

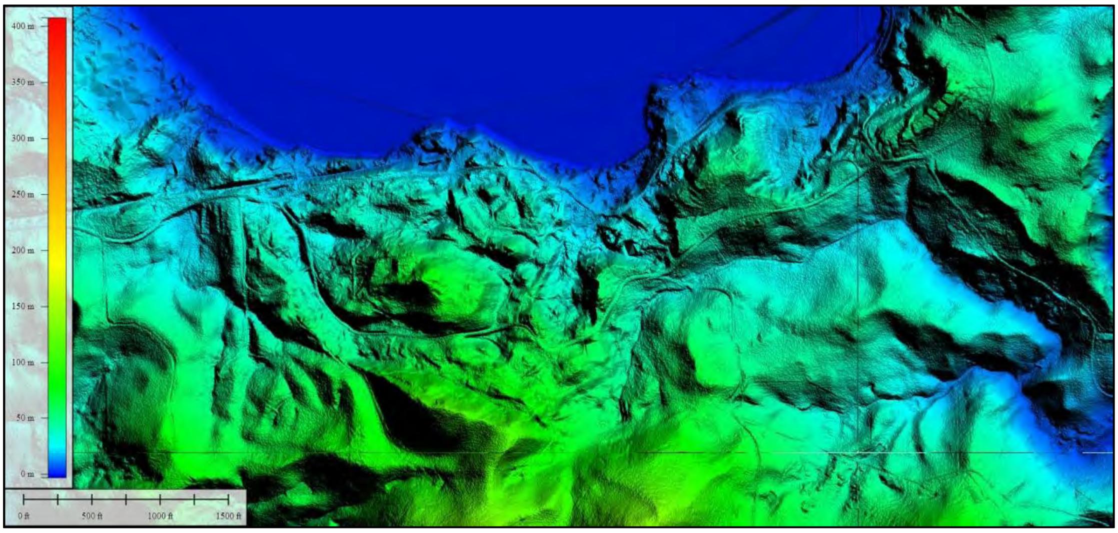

Figure 2: Lidar Terrain image of the Moeraki landslip

Figure 1: Surface rupture from phase of rapid movement in 2010. A rupture of this nature is sufficient to destroy a house.

5 Investigations

Investigations conducted on behalf of the Earthquake Commission (EQC) to date that have substantially informed this report have comprised:

- Examination of geomorphology using stereo-pair aerial photos.
- Field engineering geological mapping of the landslip area, including scarps and ponds. Detailed mapping has focused on the Davids-Glamorgan St Landslip with reconnaissance over a larger area.
- Drilling of five vertical cored drillholes and three inclined holes in the Davids-Glamorgan St Landslip, with installation of piezometers and one inclinometer. Mandrel probing of Casagrande piezometer tubes has allowed detection of active slip areas where inclinometers are not present.
- Monitoring of new and old survey markers on the slip, and analysis of data from long-term monitoring

5.1 Monitoring of Long-Term Deformation

Long-term deformation monitoring has been carried out through a network of existing cadastral survey marks through the Moeraki area.

This monitoring has included historical survey records (from as early as 1961) to determine the coordinate positions of relevant marks. Over time, various cadastral surveys have recorded observations to common marks. These data identify whether any movement has occurred at the particular locations, and if so, the rate of that movement over the years between survey records.

There are numerous cadastral marks throughout the subject region, however only the marks which have a strong measurement network to control marks that are sited outside the area of land movement have been used. This ensures that the movements determined are true. The majority of the marks used have robust networks attaching to the fundamental survey mark known as Trig E, this mark being located some 1.3 km to the south of Haven Street, well away from the unstable land identified from its geomorphology.

5.1.1 Otago Survey School Survey

The Otago University School of Surveying has been undertaking monitoring within the Moeraki Township on a generally annual basis since 2006.

This monitoring has involved re-measurement of a group of around 50 marks spread throughout the township area and the evaluation of the mark positions over time. Of these, 23 lie within the region of interest and have now been resurveyed to determine movement rates for each of these marks.

As with the other long term deformation marks the measurements to the 23 Survey School marks have been accurately linked into a secure control network. This allows the positional data to be reliably compared between the various survey dates.

It is interesting to note that the interim measurements by the University, over the years 2007, 2008 and 2009, indicate a general pattern of movement which is consistent through the years both in terms of movement rate and direction.

5.1.2 July 2010 Survey

As part of the stability assessment, additional new monitoring marks have been established in the region of Haven, Swansea and Tydvil Streets. The positions of these marks have been measured upon their initial establishment (some on the 28th June, some on the 23rd July) and then again on the 4th August.

The purpose of these marks is to identify and quantify any pattern of ongoing movement which has resulted from the recent events which triggered this recent investigation.

Again, these marks have been linked into an extended control network of marks which are believed to be free of land movement.

The marks, together with their determined movement and date of placement, are displayed in magenta on the 'PPP Marks' monitoring plan (Appendix B of the EQC Report).

Figure 3: Moeraki in 1962 (VC Browne Archive)

6 Hazard Identification - Level of Detail

The study comprised of updating the current Hazard Map so that the inventory of existing landslips may be classified at the "Intermediate" level as defined by the Australian Geomechanics Society (AGS) (see table below, and References section). Within the EQC study, field mapping was carried out a scale of 1:1000 to more accurately define hazards to individual properties.

The EQC study identifies many features that may or may not be cause for concern to individual properties. These details have not been included in this report because these details require interpretation to be understood. These features are also dynamic and any "fixed in time" definition of them risks being made inaccurate by subsequent events. To show a symbol on a map without specific discussion of how that feature relates to the land adjoining may cause undue concern within the community.

The features identified on the plans in the EQC study can also be highly variable in the extent of hazard they present to adjoining land. The broad zoning approach taken in this document is sufficient and appropriate for the purposes of identifying land at risk of hazard for regulatory purposes. This purpose is to identify land where a specific investigation is to be conducted before any building consent or resource consent is issued that evaluates both the risk presented by any features on or adjoining a specific lot of land but also considers the activity that is proposed to occur on that land as to its vulnerabilities. Characterisation of the potential for landslips to occur is to the "Basic" level and reliance on it should be to this level only. The following table prepared by the Australian Geomechanics Society (AGS) identifies the level of site knowledge and the response that can be supported by that.

Table 1.1 - AGS Definition of Zoning Levels

Type of Zoning	Risk Zoning						
	Hazard Zoning						
	Susceptibility Zoning						
	Inventory Mapping						
Zoning Level	Inventory of existing landslips	Characteriz-ation of potential landslips	Travel distance and velocity	Frequency assessment	Temporal spatial probability	Elements at risk	Vulnerability
Preliminary	Basic [1,2]	Basic [1,2]	Basic [1] Intermediate [2]	Basic [1,2]	Basic [1,2]	Basic [1,2]	Basic [1,2]
Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate to Basic
Advanced	Sophisticated	Sophisticated to Intermediate	Intermediate to Sophisticated	Intermediate to Sophisticated	Sophisticated	Sophisticated	Intermediate to Sophisticated

Notes:

2. For qualitative zoning
3. For quantitative zoning

From p19 Australian Geomechanics Journal and News of the Australian Geomechanics Society Volume 42 No 1 March 2007

DEFINITION OF THE LEVELS OF ZONING defines the levels of landslide inventory, susceptibility, hazard and risk zoning in terms of geotechnical and other input data. The definitions of the levels of the input data are given in Section 8. It is important to match the level of the zoning to the required usage, the scale of mapping and in turn match these to the level of the input data. It is not possible, for example, to produce a satisfactory advanced level hazard zoning without at least intermediate level assessment of frequency of landsliding. If only a basic level assessment of frequency can be made then the result will be no better than preliminary level and there is no point spending large resources getting the other inputs to a intermediate or, in particular, to a sophisticated level. On the other hand, if a preliminary level hazard zoning is required then the inputs may be at the basic level.

Full text available at
http://www.google.co.nz/url?sa=t&rct=j&q=australian%20geomechanics%20society%20hazard&source=web&cd=1&ved=0CCoQFjAA&url=http%3A%2F%2Faustraliangeomechanics.org%2Fadmin%2Fwp-content%2Fuploads%2F2010%2F11%2FLRM2007-a.pdf&ei=U8FzT_S1GcLFmQWsz6yKCA&usg=AFQjCNHXTJL51e0orYieuqRD0TMoaWDiCg

This table identifies the relative level of work undertaken to date in identifying the effects of the slip and understanding the dynamics of its performance. This current level of knowledge is sufficient for the purposes of insurance functions of EQC and is sufficient for identifying areas at risk of future failure or deformation such that further detailed study can be required at a scale relevant to the proposed activity.

Should a "whole of landslip" remediation program be considered then the level of sophistication of the investigation would need to increase accordingly. Particularly a more extensive drilling program would be required.

6.1 Slope Stability

The primary hazard in Moeraki is slope instability caused by large creeping landslips in mudstone. The classification adopted for the landslips is as follows:

Table 4.1 – Risk Classification

	Risk Level	Hazard Map Colour	Implications
VH	Very High Risk	Purple	Extensive detailed investigation, planning and implementation of treatment options would be necessary to consider development. Even then likely to be too expensive, unsafe and impractical even for relocatable buildings
H	High Risk	Red	Detailed investigation and implementation of treatment options required to reduce risk to an acceptable level for a ductile relocatable building
M	Moderate Risk	Orange	Tolerable provided treatment plan is implemented to maintain or reduce risk to a ductile relocatable dwelling and subject to s73 notice. EQC cover not likely to be available for new buildings or alterations for this category and above.
L	Low Risk	Yellow	Usually accepted. Treatment requirements and responsibility to be defined to minimise or reduce risk. EQC cover for new developments dependent on treatment adopted
VL	Very Low Risk	Green	Acceptable. Manage by normal investigations, design and maintenance. Standard EQC cover would be expected.

Mapping of all residential areas in and around Moeraki has been completed to define the relative risk areas. Details are contained in the report to the EQC (Tonkin & Taylor (2011)) included in Appendix B.

6.2 Seismic Hazards

Seismic hazards have now been brought into focus by recent events in Canterbury, and many Councils are upgrading their systems as a result.

The greatest seismic risk at Moeraki is from an earthquake on the Alpine Fault (Appendix A Figures A2 & A3), considered to have a high probability in the next 50 years. Other active faults in Otago lie closer to Moeraki (refer to Appendix A FigureA5) but have much longer return periods, typically of the order of thousands of years, and are hence considered to present a lower risk. However, a low probability earthquake on a local fault, as occurred at Christchurch, has the potential for much stronger shaking at Moeraki.

In considering the effect of an Alpine Fault or of a closer local event on Moeraki, the two main issues will be the intensity of shaking in view of the attenuation that will occur with distance from the fault, but also the duration of the shaking and consequent effects such as reactivation of existing landslips, rockfall, liquefaction and flow slips (lateral spreading).

A local fault event could result in more intense shaking but for a short duration while a major event on a more distant fault such as the alpine fault could result in less intense shaking but for a much more prolonged period.

6.2.1 Seismic Effects on Land Stability

The effect of an earthquake on land stability will depend on the intensity of shaking. As indicated in Appendix A Figure A4, the intensity expected from a Magnitude 8 Alpine Fault earthquake is MM3-MM4 (Slightly damaging - ref Table A1). However, an earthquake on one of the closer active faults in the Otago region, although of low probability, could generate much more severe shaking, possibly up to MM8.

Molineux (1983) identified a fault through the landslip area, this feature has not been identified by any other source and is not identified as an active or “activity unknown” fault in the QMAP database as shown in Appendix A Figure A5.

Seismic shaking could cause reactivation of existing landslips, and first-time sliding or incipient sliding in areas not previously affected by slope instability. Experience in the Port Hills at Christchurch has shown that properties on or near the crest of steep slopes are particularly vulnerable to amplification of seismic shaking, which exacerbates instability. There are a number of properties at Moeraki that may to be vulnerable to this effect.

It is apparent from the Port Hills experience that earthquake induced landslip movements do not have to be large to have major consequences. Houses have been seriously damaged by incipient landslip cracking with displacements of 100mm or less.

Seismic shaking may trigger rockfalls on steep slopes, and there are volcanic outcrops above Moeraki town that appear vulnerable to rockfall activity.

The liquefaction and lateral spreading experienced at Christchurch is not apparent as a major hazard at Moeraki, though there may be some localised low lying areas that are vulnerable to these effects if subject to strong seismic shaking.

Any remediation work to improve landslip stability can also be expected to significantly reduce the risk of earthquake induced rapid failure within the landslip area at Moeraki.

6.2.2 Storm Water Issues

The injection of stormwater into the ground within the landslip catchment area shown on Figure A1 and on the digital hazard map has the potential to reduce the stability of the landslip i.e. 'accelerate, worsen, or result in a natural hazard on the land' (to use the terms of the Building Act). This widens the affected area to include land that is not currently slipping, but is within the catchment that contributes to the groundwater that is the primary driver of instability in this area.

It has been demonstrated that drawing from groundwater in one location can quickly (within hours) causes a dramatic change in groundwater levels several hundred metres away. Because of this extreme sensitivity to groundwater pressure, issuing consent will contravene the Building Act unless there is no injection of stormwater, i.e. all stormwater is piped off the site to a council approved surface drain or stormwater pipe.

Open channels do not need to be sealed but must be designed to avoid ponding, and maintained to remove silt and debris and must be able to conduct a 1:100 rainfall event through any culvert or other piped element.

The appropriate time for establishing site drainage would be at the time of subdivision, each new lot needs to be serviced by a stormwater disposal system otherwise it will fall upon subsequent land owners, once they apply for Building Consent.

Where there is currently no such service, it is strongly recommended that council require at the time of application for either subdivision, new building consent or consent for an alteration that the stormwater cannot be put into the ground and must be piped off the site to an approved drain or channel.

Council needs to seriously consider establishing a whole of community approach to the disposal of stormwater and require existing properties to pipe all runoff from any hard surface to a council maintained drain. The advantage of installing full reticulation of stormwater is that this will greatly assist in reducing current movement rates of the landslips. The consequences of a wider stormwater infiltration remediation program will be reduced maintenance costs, higher land values, more straightforward design of new buildings and possibly some revision of current risk levels.

All unlined storage ponds should be prohibited in the catchment, unless it is periodically demonstrated that they allow no seepage. These considerations apply to both the 292 titles on the landslip and the 107 titles that are outside the landslip but within the catchment area as shown in Appendix 1 Figure A1.

The Earthquake Commission may seek a change to the Waitaki District Council's current stormwater policy and that can be put into effect most simply under the RMA by the local authority initiating a change to its District plan

Any drain that uses a perforated or permeable pipe to remove water needs to be of a construction that contains water so that it acts as a carrier pipe in its bottom half otherwise it must be laid on an impermeable material such as PVC film. Permeable drains also need to be dammed at 25metre intervals with bentonite to prevent water being conducted outside the pipe along the drain channel.

7 Further investigations

The investigations so far have been primarily directed at assessing the effects of the slips, not its cause. There is clear evidence that the slip is highly sensitive to heavy rainfall events. This indicates that if a substantial reduction in infiltration to ground water from such events could be achieved that this should considerably reduce the overall rate of movement within the slip. Any such reduction of this nature could be particularly effective at minimising the risk of brief phases of accelerated movement that are most potentially damaging and should also reduce the risk of localised catastrophic failures. This propensity for increased movement during severe rain events could be reduced by reducing the amount of ground and surface water that enters the slips as a result of prolonged or intense wet weather. Substantial further investigations would be required to enable the design of an intervention of this nature which could include cut-off drains at the head of the slip, contained surface drainage, and subterranean pumped and gravity drainage within the slip area.

It is expected that any such further investigation would at least require a more extensive drilling program to better understand the structure of the slip and the ground water conditions within and adjoining it. Before any such program could be considered the parties involved, the Earthquake Commission, Waitaki District Council, and the Community of Moeraki, would need to agree on a common approach to the issues as the programme of investigations would be developed to reflect the level of intervention that the affected parties are prepared to fund.

8 Planning and regulatory response

If development is proposed in the vicinity of any area where a hazard or potential hazard has been identified, the site is to be examined by an inspector or engineer competent to confirm the status of the site and the need for further investigations. This inspection needs to occur <u>prior to</u> any other work being undertaken as the response to the geotechnical constraints on the site will influence all subsequent aspects of site development. This is particularly the case where substantial modifications to the land profile (especially excavations) are proposed.

The processes outlined in the Waitaki DC's website Q&A page on the Moeraki Landslip provide sound guidance to existing and potential property owners in Moeraki. As this webpage states, Council must require that the hazard issues within the Moeraki Slip area are addressed through the District Plan and through its administration of the Building Act.

This report on the Moeraki landslip does not mean that no more buildings can be built in the Moeraki township, nor does it in any way suggest the great majority of the existing structures are likely to be significantly damaged or the life of the building significantly reduced. The report identifies that the risk of landslip damage is higher in the slip area and that this risk can be reduced to acceptable levels in many parts of the settled area by avoiding certain parts of the slip, by building or developing the land in a way that accommodates the particular issues with the land, and by avoiding actions that may make the slip less stable. Where any new development is proposed, this report intends to ensure that proper consideration is given to the particular issues that will need to be addressed for the development to occur in a safe manner.

9 Applicability

This report has been prepared for the benefit of Waitaki District Council with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:	Authorised for Tonkin & Taylor Ltd by:
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JJMM

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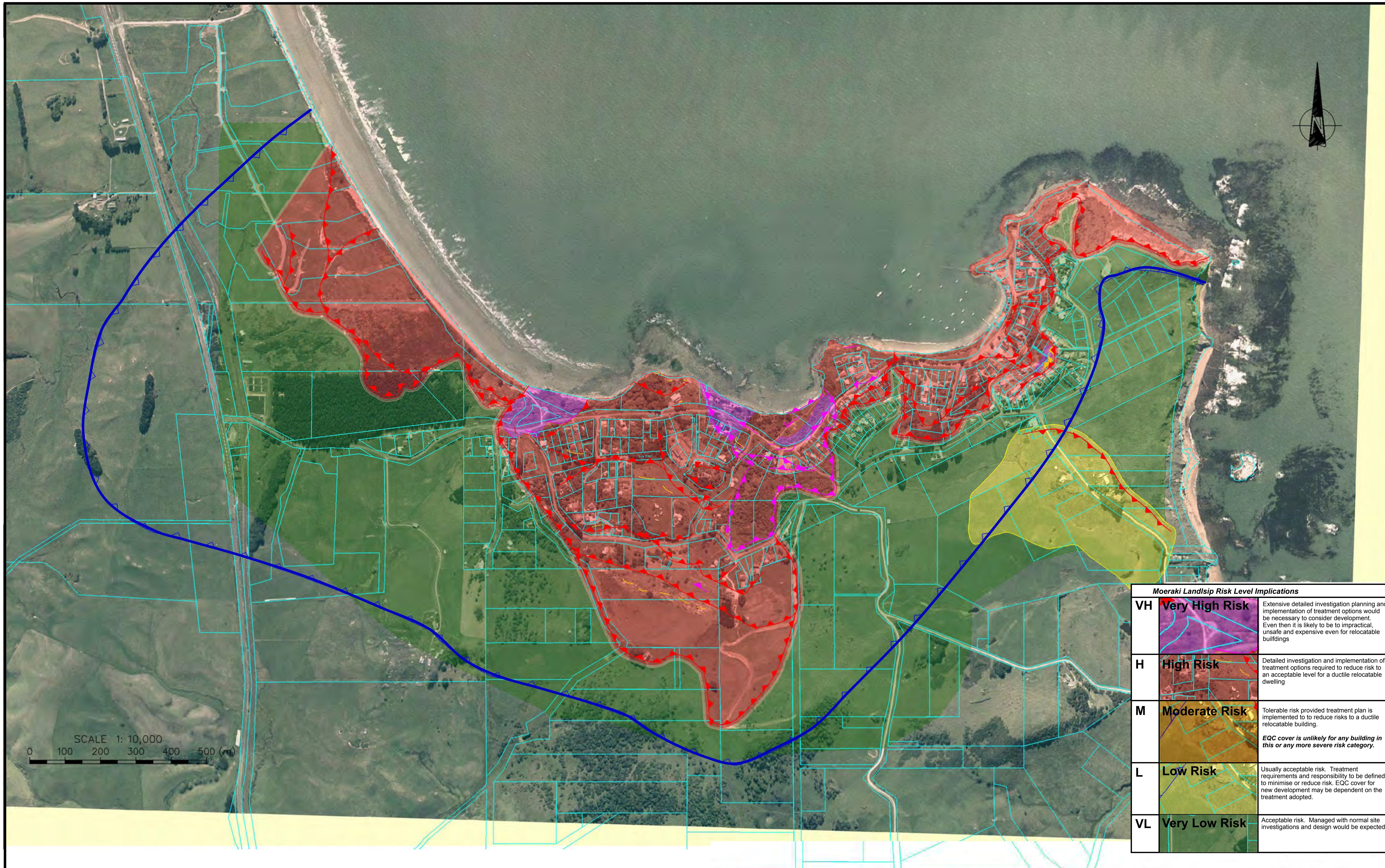
Appendix A: Hazard Map



Moeraki Landlsip Risk Level Implications

VH	Very High Risk	Extensive detailed investigation planning and implementation of treatment options would be necessary to consider development. Even then it is likely to be to impractical, unsafe and expensive even for relocatable builfdings
H	High Risk	Detailed investigation and implementation of treatment options required to reduce risk to an acceptable level for a ductile relocatable dwelling
M	Moderate Risk	Tolerable risk provided treatment plan is implemented to to reduce risks to a ductile relocatable building. ***EQC cover is unlikely for any building in this or any more severe risk category.***
L	Low Risk	Usually acceptable risk. Treatment requirements and responsibility to be defined to minimise or reduce risk. EQC cover for new development may be dependent on the treatment adopted.
VL	Very Low Risk	Acceptable risk. Managed with normal site investigations and design would be expected

Up-Gradient boundary of groundwater recharge catchment

Within the designated boundary of the groundwater recharge catchment of the Moeraki landslip area no stormwater should be put to ground, and all ponds must be drained or lined.

Lined ponds shall be regularly inspected for water tightness.

Stormwater needs to be contained and removed from the designated catchment area through a council approved drainge system.

Existing Scarp

2010 Active Scarp

2010 Surficial Scarp

Tonkin & Taylor

Environmental and Engineering Consultants

Level 1, 70 MacAndrew Road, South Dunedin

www.tonkin.co.nz

DRAWN	JJMM	17/08/2011
DRAFTING CHECKED		
APPROVED		
CADFILE : 892095–F01.dwg		
SCALES (AT A3 SIZE) 1: 10000		
PROJECT No. 892095		

WAITAKI DISTRICT COUNCIL

MOERAKI HAZARD MAP

MOERAKI

Overview

FIG. No. **Figure A1**

REV. 5

Appendix A (cont) Hazard Mapping information sources and bibliography

A1 Photography

WDC provided ortho-rectified geo-referenced colour photography of the area of investigation which was combined into a single file for convenience. Higher resolution aerial photography for Moeraki had been gathered for previous jobs and was also used. Otago Regional Council provided LDAR data for terrain modelling.

A2 Geology and Hazards

Geological information was sourced from a University of Canterbury thesis on the engineering geology of the Moeraki area by Michael Molineaux, the Geological and Nuclear Sciences QMAP (1:250,000), and the former landslip risk map produced by Tonkin & Taylor Ltd for the WDC.

This was combined with information from local EQC site investigation by engineering geologists with experience in the region to verify the accuracy of the content.

A2.1 Faulting

The following figures show the Alpine Fault, inferred historic movements and the intensity of shaking expected throughout the South Island (Orchiston, 2010).

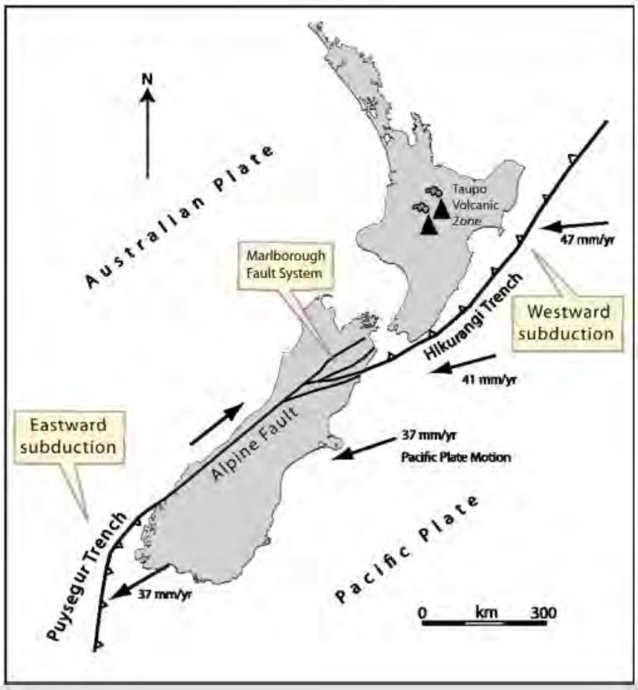


Figure A2 - Overview of the Alpine Fault

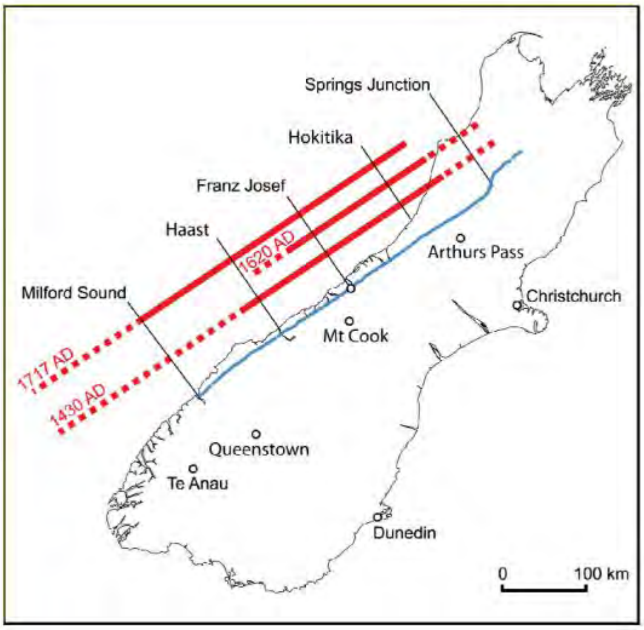


Figure A3 - Inferred historic movement of the Alpine Fault

The Mercalli Intensity of shaking expected from alternative Alpine Fault events is shown below.

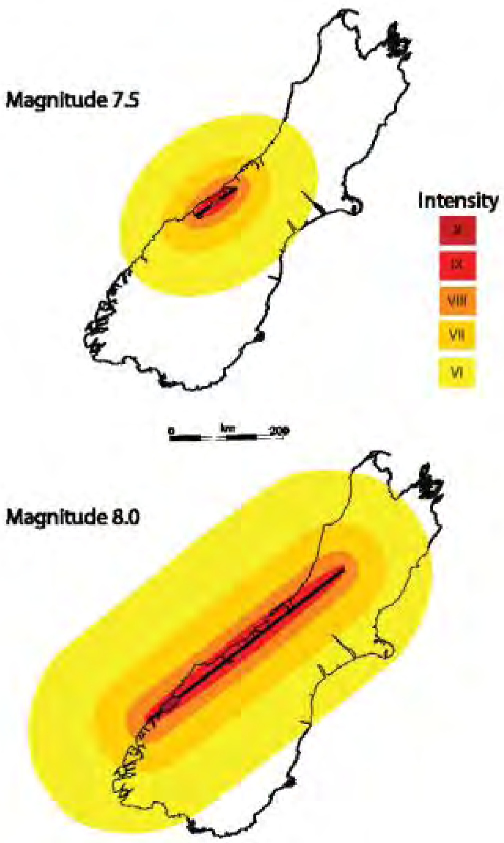
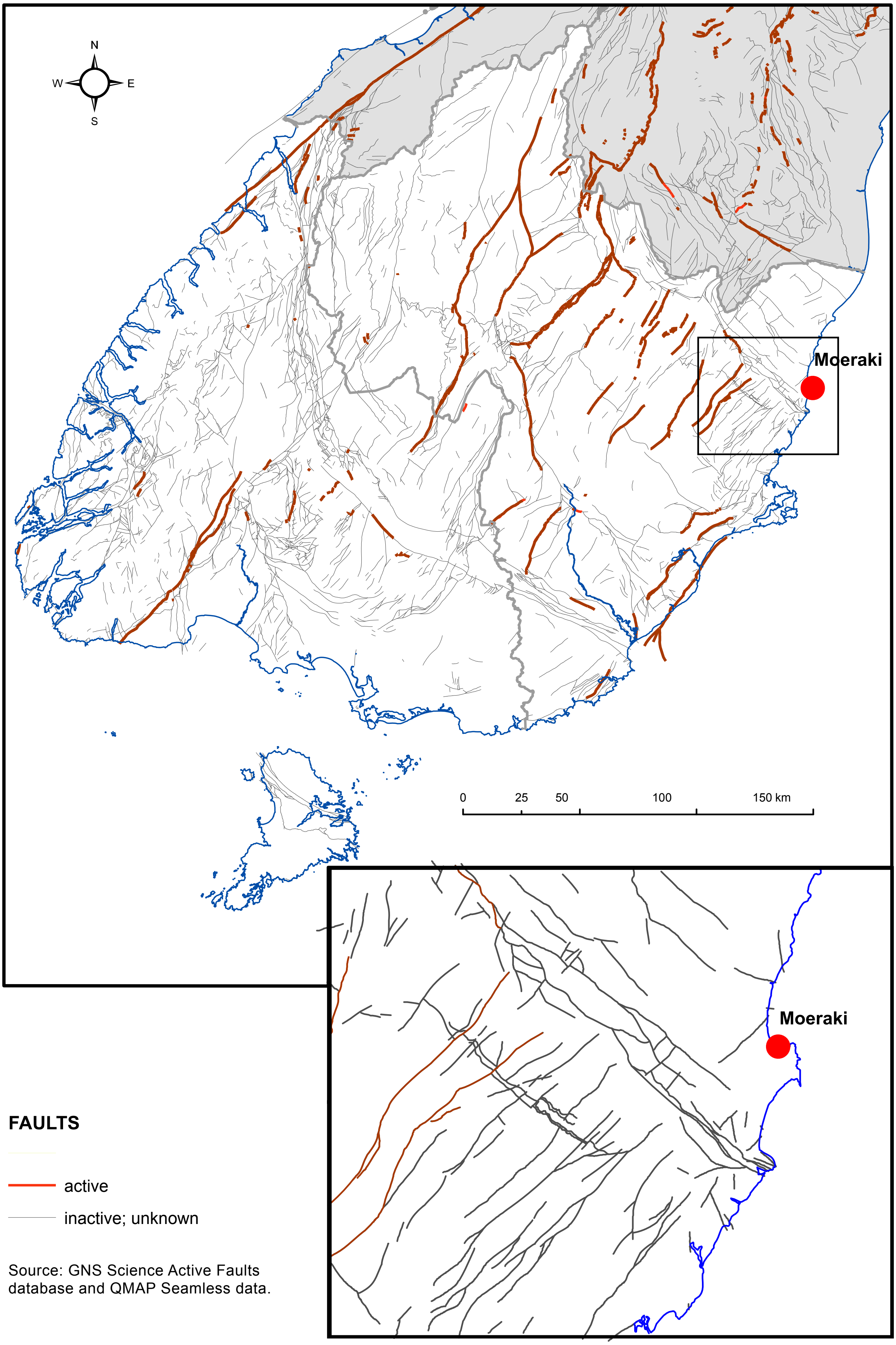


Figure A4 - Predicted Mercalli Intensity from Alpine Fault movements.

MM 1: Imperceptible
Barely sensed only by a very few people.
MM 2: Scarcely felt
Felt only by a few people at rest in houses or on upper floors.
MM 3: Weak
Felt indoors as a light vibration. Hanging objects may swing slightly.
MM 4: Largely observed
Generally noticed indoors, but not outside, as a moderate vibration or jolt. Light sleepers may be awakened. Walls may creak, and glassware, crockery, doors or windows rattle.
MM 5: Strong
Generally felt outside and by almost everyone indoors. Most sleepers are awakened and a few people alarmed. Small objects are shifted or overturned, and pictures knock against the wall. Some glassware and crockery may break, and loosely secured doors may swing open and shut.
MM 6: Slightly damaging
Felt by all. People and animals are alarmed, and many run outside. Walking steadily is difficult. Furniture and appliances may move on smooth surfaces, and objects fall from walls and shelves. Glassware and crockery break. Slight non-structural damage to buildings may occur.
MM 7: Damaging
General alarm. People experience difficulty standing. Furniture and appliances are shifted. Substantial damage to fragile or unsecured objects. A few weak buildings are damaged.
MM 8: Heavily damaging
Alarm may approach panic. A few buildings are damaged and some weak buildings are destroyed.
MM 9: Destructive
Some buildings are damaged and many weak buildings are destroyed.
MM 10: Very destructive
Many buildings are damaged and most weak buildings are destroyed.
MM 11: Devastating
Most buildings are damaged and many buildings are destroyed.
MM 12: Completely devastating
All buildings are damaged and most buildings are destroyed.

Table A1 - Mercalli Scale of felt earthquake intensity

Figure A5 Identified Faults Moeraki and Environs



FAULTS

active

inactive; unknown

Source: GNS Science Active Faults database and QMAP Seamless data.

Appendix B: Electronic Files

All files for the study are contained on a CD accompanying the hardcopy of this report.

Appendix B lists the electronic files that accompany this report available for viewing and interrogation of the study area.

AutoDesk TrueView for viewing dwg files can be downloaded free of charge.

Appendix C: Schedule of Affected Properties

Appendix B - List of files on CD

All files for the study are contained on a CD accompanying the hardcopy of this report. Appendix B lists the electronic files that accompany this report available for viewing and interrogation of the study area.

AutoDesk TrueView for viewing dwg files can be downloaded free of charge.

1. MoerakiHazard.pdf
   - PDF copy of full report
2. Appendix A Hazard Map.pdf
   - PDF version of Hazard Map as included in report
3. Appendix B.zip
   - Contains CAD drawing files of maps
4. Appendix C.pdf
   - Contains the tables of affected properties in Moeraki
5. MoerakiReportApril.pdf
   - EQC Report draft as at April 2012

Appendix C: Schedule of Affected Properties

LINZ CRS ID	Legal Description	Affected by scarp	Within Groundwater Recharge Boundary	Hazard Classification
3016377	Lot 19 DP 11746 0.0809	TRUE	TRUE	H
3154627	Pt Sec 8 Blk IV Town of Moeraki (SO 13127, SO 14576) 0.0395	TRUE	TRUE	H
3079692	Lot 2 DP 15253 0.141	FALSE	TRUE	H
3119993	Pt Sec 14 Blk II Town of Moeraki (SO 14582) DCDB Document Id: CT B1/2 (0.1577)	FALSE	TRUE	H
3061830	Sec 1 Blk XVII Town of Moeraki (SO 12579) 0.0792	FALSE	TRUE	H
6837309	Lot 1 DP 363564 0.0422	FALSE	TRUE	H
3059413	Sec 3 Blk VI Town of Moeraki (SO 14576) 0.0961	TRUE	TRUE	H
3168684	Lot 1 DP 27177 0.1014	FALSE	TRUE	H
3120341	Crown Land Blk VIII Town of Moeraki	FALSE	TRUE	H
3104430	Lot 2 DP 11016 0.172	TRUE	TRUE	H
3102565	Sec 6 Sec 17 Blk I Moeraki Survey District (SO 5788) 0.2479	FALSE	TRUE	VL
3009004	Sec 1 Blk XIII Town of Moeraki (SO 14583) 0.3516	FALSE	TRUE	VL
3050968	Sec 8 Blk XVI Town of Moeraki (SO 14582) 0.4679	FALSE	TRUE	VL
3035731	Pt Sec 13 Blk I Moeraki Survey District (SO 1111, SO 15338) DCDB Document Id: CT 232/122 0.9156	FALSE	TRUE	None
7008526	Lot 5 DP 395321 0.1016	TRUE	TRUE	H
3123925	Lot 2 DP 27177 0.1014	TRUE	TRUE	H
6837310	Lot 2 DP 363564 0.4307	TRUE	TRUE	H
3052170	Lot 29 DP 11746 0.1239	TRUE	TRUE	H
6861187	Lot 1 DP 369536 0.2075	FALSE	FALSE	H
3058005	Sec 19 Blk V Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	VL
3104768	Sec 2 Blk XI Town of Moeraki (SO 14576) DCDB Document Id: CT 15A/989 0.4047	TRUE	TRUE	H
3094906	Lot 30 DP 11746 0.1313	TRUE	TRUE	VH
6840112	Lot 2 DP 360969 0.0679	FALSE	TRUE	H
3026439	Sec 21 Blk I Town of Moeraki (SO 14576) 0.3035	FALSE	TRUE	VH
3033989	Sec 14 Blk VIII Town of Moeraki (SO 13188) 0.0809	FALSE	TRUE	H
3059305	Sec 19 Blk VI Town of Moeraki (SO 16794) 0.1778	TRUE	TRUE	H
3016195	Lot 18 DP 11746 0.0809	TRUE	TRUE	H
3058723	Lot 1 DP 10267 0.0809	FALSE	TRUE	H
6901103	Pt Sec 3 Blk I Town of Moeraki (SO 371002) 0.0926	TRUE	TRUE	VH
3158897	Sec 9 Blk I Town of Moeraki (SO 14578) 0.1012	FALSE	TRUE	H
6714090	Lot 1 DP 340844 0.3438	FALSE	TRUE	H
7008524	Lot 3 DP 395321 0.073	TRUE	TRUE	H
3019185	Sec 2 Blk IV Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
6930266	Lot 3 DP 361805 0.0583	FALSE	TRUE	H
3162981	Sec 26 Blk VII Town of Moeraki (SO 14585) 0.0126	FALSE	TRUE	H
3147180	Lot 1 DP 15719 0.1114	TRUE	TRUE	H
6728061	Lot 13 DP 342272 0.7328	FALSE	FALSE	VL
3119803	Sec 10 Blk VII Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3144770	Sec 15 Blk VIII Town of Moeraki (SO 13188) 0.127	TRUE	TRUE	H
3018956	Sec 8 Blk XVII Town of Moeraki (SO 12579) 0.0938	FALSE	TRUE	H
6692818	Lot 1 DP 328021 0.3311	FALSE	TRUE	H
3077620	Sec 18 Blk VIII Town of Moeraki (SO 19303) 0.1085	FALSE	TRUE	H
6735278	Pt Sec 9 Blk IV Town of Moeraki 0.0716	FALSE	TRUE	H
3019618	Sec 11 Blk II Town of Moeraki (SO 14578) 0.2428	FALSE	TRUE	H
3137677	Sec 13 Blk III Town of Moeraki (SO 14576) 0.1265	TRUE	TRUE	VH
6741176	Sec 1 SO 344771 0.0942	FALSE	TRUE	VL
3144682	Sec 11 Blk VI Town of Moeraki (SO 14576) 0.0809	FALSE	TRUE	H
3052663	Pt Sec 11 Blk I Town of Moeraki (SO 14578) DCDB Document Id: CT 404/139 0.0405	FALSE	TRUE	H
7288995	Lot 5 DP 424418 0.4773	FALSE	FALSE	VL
3077596	Sec 24 Blk VII Town of Moeraki (SO 14585) 0.0025	FALSE	TRUE	H
3061828	Sec 1048R Blk XI Town of Moeraki (SO 10548) DCDB Document Id: CT 15A/989 0.1163	TRUE	TRUE	H
3104428	Lot 4 DP 11746 0.0809	FALSE	TRUE	VL
3128144	Sec 2 SO 24643 DCDB Document Id: CT 11A/963 0.0607	FALSE	TRUE	H
7008522	Lot 1 DP 395321 0.0976	TRUE	TRUE	H
3058294	Lot 23 DP 11746 0.0837	FALSE	TRUE	H
3018955	Sec 5 Blk XVII Town of Moeraki (SO 12579) 0.064	FALSE	TRUE	H
3170765	Lot 2 DP 25390 DCDB Document Id: CT 17B/1195 0.5958	TRUE	TRUE	H
3104750	Sec 8 Blk XV Town of Moeraki (SO 14576) 0.2732	FALSE	TRUE	VL
6735279	Sec 1 SO 13127 0.0359	TRUE	TRUE	H
3009208	Sec 12 Blk X Town of Moeraki (SO 14576) 0.301	FALSE	TRUE	H
6857732	Sec 1 SO 369811 0.0053	FALSE	TRUE	H
3040800	Railway Land Blk I Moeraki SD	FALSE	TRUE	VL
3073475	Sec 5 Blk IV Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3116249	Sec 13 Blk I Town of Moeraki (SO 14578) 0.1012	TRUE	TRUE	H
6502767	Lot 2 DP 300183 0.0953	FALSE	TRUE	H

Risk Zones	
VH	Very High Risk
H	High Risk
M	Moderate Risk
L	Low Risk
VL	Very Low Risk

7261097	Lot 2 DP 428541 0.069	FALSE	TRUE	H
3014490	Lot 7 DP 15623 0.1248	FALSE	TRUE	H
3051974	Lot 34 DP 11746 0.0809	FALSE	TRUE	VL
3143752	Sec 15 Blk VI Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
3147178	Sec 8 Blk V Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3073145	Lot 5 DP 15623 0.0876	FALSE	TRUE	H
3121263	Pt Sec 1 Sec 15 Blk I Moeraki Survey District (SO 1111) DCDB Document Id: CT 271/94 (12.8741)	FALSE	FALSE	None
3016118	Sec 13 Blk VI Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
6795351	Lot 2 DP 357219 0.1194	FALSE	TRUE	H
3101485	Sec 1 Blk VII Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
6652763	Lot 3 DP 327619 0.0306	FALSE	TRUE	M
3008984	Sec 6 Blk IX Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
6840111	Lot 1 DP 360969 0.4916	TRUE	TRUE	H
3146531	Lot 8 DP 11746 0.0893	TRUE	TRUE	H
3073493	Pt Sec 11 Blk XVI Town of Moeraki (DP 5482, SO 14582) (0.1012)	FALSE	TRUE	VL
3033630	Lot 3 DP 20996 0.251	TRUE	TRUE	H
3144746	Sec 5 Blk XV Town of Moeraki (SO 14576) 0.4148	FALSE	TRUE	VL
3155848	Lot 1 DP 20996 0.1559	TRUE	TRUE	H
7112205	Lot 1 DP 407582 0.1091	FALSE	TRUE	M
3094924	Sec 47 Blk XVI Moeraki Survey District (ML 66) 0.1012	FALSE	TRUE	VL
6861188	Lot 2 DP 369536 0.1332	FALSE	TRUE	H
3104431	Sec 14 Blk V Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	VL
6857733	Sec 2 SO 369811 0.0134	FALSE	TRUE	H
3034786	Sec 30 Blk VII Town of Moeraki (SO 12356) 0.0024	FALSE	TRUE	H
3030789	Sec 4 Blk V Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	VH
3137720	Lot 12 DP 11746 0.0814	TRUE	TRUE	VH
6930265	Lot 2 DP 361805 0.0674	FALSE	TRUE	H
3090037	Sec 5 Blk XVI Town of Moeraki (SO 14582) 0.4148	FALSE	TRUE	VL
3069211	Sec 4 Blk XVI Town of Moeraki (SO 14582) 0.4173	FALSE	TRUE	VL
3058716	Lot 16 DP 11746 0.1249	TRUE	TRUE	VH
3027591	Pt Sec 2 Blk XVI Town of Moeraki (DP 2889, SO 14582) (0.0513)	FALSE	TRUE	VL
6799152	Lot 2 DP 353011 0.5518	TRUE	TRUE	H
3061823	Lot 6 DP 11746 0.0809	FALSE	TRUE	VL
3170111	Sec 6 Blk IV Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3034813	Sec 5 Blk VII Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
3165611	Sec 9 Blk II Town of Moeraki (SO 14578) 0.1113	TRUE	TRUE	H
3077609	Sec 21 Blk VII Town of Moeraki (SO 12356) 0.0025	FALSE	TRUE	H
3017669	Sec 13 Blk V Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	M
6799151	Lot 1 DP 353011 0.0859	TRUE	TRUE	H
3019253	Sec 4 Blk XV Town of Moeraki (SO 14576) 0.4274	FALSE	TRUE	VL
3162521	Sec 17 Blk VII Town of Moeraki (SO 14576) 0.0885	TRUE	TRUE	H
3051702	Sec 17 Blk V Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	M
3015557	Lot 24 DP 11746 0.0809	TRUE	TRUE	H
3129887	Sec 34 Blk XVI Town of Moeraki (SO 14584) 0.3415	TRUE	TRUE	H
3008691	Sec 5 Blk I Town of Moeraki (SO 14578) 0.1012	TRUE	TRUE	H
3016453	Lot 2 DP 15719 0.0922	TRUE	TRUE	H
3061832	Lot 1 DP 10377 0.0809	TRUE	TRUE	H
3085662	Lot 1 DP 11464 0.0711	FALSE	TRUE	L
3019561	Lot 3 DP 15623 0.3751	FALSE	TRUE	H
3116247	Sec 7 Blk I Town of Moeraki (SO 14578) 0.1012	FALSE	TRUE	H
3150405	Sec 3 Blk XIV Town of Moeraki (SO 14583) 0.3946	FALSE	TRUE	VL
3009221	Sec 10 Blk XVI Town of Moeraki (SO 14582) 0.6526	FALSE	TRUE	VL
3030788	Sec 2 Blk V Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3144221	Sec 16 Blk VI Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3147465	Pt Sec 1 Blk XII Town of Moeraki (SO 14581) DCDB Document Id: CT 15A/989 (1.7161)	TRUE	TRUE	H
3034806	Lot 26 DP 11746 0.0809	TRUE	TRUE	H
6567587	Lot 2 DP 303791 0.1117	FALSE	TRUE	H
6891007	Lot 1 DP 376566 0.2061	TRUE	TRUE	H
3162984	Sec 16 Blk VII Town of Moeraki (SO 14576) 0.086	TRUE	TRUE	H
6530255	Sec 1 SO 303584 0.1008	TRUE	TRUE	H
6567586	Lot 1 DP 303791 0.0503	TRUE	TRUE	H
3051919	Sec 12 Blk VIII Town of Moeraki (SO 13188) 0.0916	TRUE	TRUE	H
3094894	Sec 3 Blk IX Town of Moeraki (SO 14579) 0.1012	TRUE	TRUE	H
3052163	Lot 7 DP 11746 0.0809	FALSE	TRUE	VL
3073512	Lot 2 DP 9430 0.3541	FALSE	TRUE	H
3052015	Sec 6 Blk XVI Town of Moeraki (SO 14582) 0.4224	FALSE	TRUE	VL
3042631	Sec 1 SO 24643 DCDB Document Id: CT 17B/1195 0.0629	TRUE	TRUE	H

3158894	Sec 15 Blk I Town of Moeraki (SO 14578) 0.1012	TRUE	TRUE	H
6505398	Sec 1 SO 300505 0.0709	TRUE	TRUE	H
3072180	Sec 5 Blk XIV Town of Moeraki (SO 14576) 0.5059	FALSE	TRUE	M
3137143	Sec 3 Blk XVII Town of Moeraki (SO 12579) 0.1161	FALSE	TRUE	H
3157557	Lot 1 DP 26727 0.2023	FALSE	TRUE	H
3119805	Lot 1 DP 10621 0.1055	TRUE	TRUE	H
3129385	Sec 9 Blk XVI Town of Moeraki (SO 14582) 0.5944	FALSE	TRUE	VL
3119819	Sec 27 Blk VII Town of Moeraki (SO 14585) 0.0111	FALSE	TRUE	H
6757817	Lot 2 DP 349194 0.6779	TRUE	TRUE	H
6741081	Lot 2 DP 345610 0.2473	TRUE	FALSE	H
3115893	Lot 2 DP 15623 0.0876	FALSE	TRUE	H
3158868	Sec 11 Blk IV Town of Moeraki (SO 14576) 0.1088	TRUE	TRUE	H
3008966	Lot 36 DP 11746 0.0809	FALSE	TRUE	VL
3062104	Sec 7 Blk XV Town of Moeraki (SO 14576) 0.4603	FALSE	TRUE	VL
3006987	Lot 6 DP 15623 0.0876	FALSE	TRUE	H
3020676	Pt Sec 11 Blk XVI Town of Moeraki (SO 14582) 0.4553	FALSE	TRUE	VL
3094884	Sec 27 Blk XVI Town of Moeraki (SO 14577) 0.7208	TRUE	TRUE	H
6974861	Pt Sec 2 of 15 Blk I Moeraki Survey District	FALSE	TRUE	VL
3008999	Sec 4 Blk XIV Town of Moeraki (SO 14576) 0.478	FALSE	TRUE	M
3009001	Sec 2 Blk XIV Town of Moeraki (SO 14583) 0.3996	FALSE	TRUE	VL
3137719	Lot 2 DP 11746 0.0809	FALSE	TRUE	VL
3020528	Sec 5 Blk VI Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3051944	Lot 28 DP 11746 0.104	TRUE	TRUE	H
3009209	Lot 1 DP 11746 0.0809	FALSE	FALSE	VL
3120032	Sec 19 Blk I Town of Moeraki (SO 14578) 0.1593	FALSE	TRUE	H
3008692	Sec 6 Blk I Town of Moeraki (SO 14578) 0.1012	TRUE	TRUE	H
3120326	Crown Land Blk VIII Town of Moeraki	FALSE	FALSE	H
3162960	Sec 7 Blk VIII Town of Moeraki (SO 12738) 0.1186	FALSE	TRUE	H
3162625	Sec 8 Blk I Town of Moeraki (SO 14578) 0.1012	FALSE	TRUE	H
6891008	Lot 2 DP 376566 0.2669	TRUE	FALSE	H
3005052	Sec 12 Blk III Town of Moeraki (SO 14576) DCDB Document Id: CT 11A/963 0.1391	FALSE	TRUE	H
3120327	Pt Sec 8A Blk VIII Town of Moeraki (SO 13189) 0.0068	FALSE	TRUE	H
3147110	Sec 3 Blk XV Town of Moeraki (SO 14576) 0.4401	FALSE	TRUE	VL
7049959	Lot 1 DP 395228 0.1603	FALSE	TRUE	H
3106764	Lot 2 DP 26727 0.2023	FALSE	TRUE	H
3111414	Sec 6 Blk VI Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
3162989	Lot 3 DP 10621 0.0974	FALSE	TRUE	H
7008525	Lot 4 DP 395321 0.0833	TRUE	TRUE	H
3034281	Sec 12 Blk VII Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
3101975	Lot 17 DP 11746 0.084	TRUE	TRUE	H
3052166	Lot 27 DP 11746 0.2605	TRUE	TRUE	VH
3073491	Lot 2 DP 15186 0.2502	TRUE	TRUE	H
3016477	Pt Sec 1 Blk XI Town of Moeraki (SO 14576) DCDB Document Id: CT 15A/989 0.4755	TRUE	TRUE	H
3119870	Sec 11 Blk VII Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
3073468	Lot 1 DP 17680 0.0999	FALSE	TRUE	H
3019048	Sec 2 Blk III Town of Moeraki (SO 14576) 0.1113	TRUE	TRUE	VH
3114166	Pt Sec 2 Blk XVI Town of Moeraki (SO 14582) DCDB Document Id: CT 187/279 (0.1712)	FALSE	TRUE	VL
3114429	Sec 8 Blk II Town of Moeraki (SO 14578) 0.1012	TRUE	TRUE	H
3084787	Pt Sec 7 Blk IV Town of Moeraki (SO 13127, SO 14576) 0.1009	TRUE	TRUE	H
3101461	Lot 22 DP 11746 0.0865	FALSE	TRUE	H
3033965	Sec 1 Blk XVI Town of Moeraki (SO 23360) 0.1452	TRUE	TRUE	H
7049960	Lot 2 DP 395228 0.4993	TRUE	FALSE	H
3094271	Sec 70A Blk I Moeraki Survey District (ML 42) 0.4173	TRUE	TRUE	H
3072603	Sec 4 Blk IV Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
6776339	Lot 10 DP 347408 0.1026	FALSE	TRUE	H
3016478	Pt Sec 1 Blk XII Town of Moeraki (SO 14581) DCDB Document Id: CT 15A/989 (1.7161)	TRUE	TRUE	H
6776338	Lot 6 DP 347408 0.1707	TRUE	TRUE	H
6692819	Lot 2 DP 328021 0.384	TRUE	FALSE	H
3016502	Sec 10 Blk VI Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
7066343	Lot 1 DP 405239 0.0851	TRUE	TRUE	L
6915398	Lot 8 DP 376209 0.0775	FALSE	TRUE	H
3162953	Sec 22 Blk VII Town of Moeraki (SO 14585) 0.0025	FALSE	TRUE	H
3077627	Lot 25 DP 11746 0.0809	TRUE	TRUE	H
3137476	Lot 31 DP 11746 0.1141	TRUE	TRUE	VH
3166388	Sec 3 Sec 17 Blk I Moeraki Survey District (SO 5788) 0.086	FALSE	TRUE	VL
3059283	Sec 7 Blk V Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3031905	Pt Sec 2 Blk XVI Town of Moeraki (SO 14582) DCDB Document Id: CT 1C/1000 (0.0986)	FALSE	TRUE	VL

3094922	Sec 6 Blk XIV Town of Moeraki (SO 14576) 0.3667	FALSE	TRUE	VL
3137383	Sec 70B Blk I Moeraki Survey District (ML 42) 0.4123	FALSE	TRUE	VL
3052153	Sec 14 Blk I Town of Moeraki (SO 14578) 0.1012	TRUE	TRUE	H
3008988	Sec 4 Blk IX Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3133238	Sec 5 Sec 17 Blk I Moeraki Survey District (SO 5788) 0.1973	FALSE	TRUE	VL
3116216	Lot 1 DP 15186 0.2921	TRUE	TRUE	H
6857734	Sec 3 SO 369811 0.0027	FALSE	TRUE	H
3022906	Sec 1B Blk XVI Town of Moeraki (ML 316) 0.2524	TRUE	TRUE	VH
3162985	Sec 9 Blk VII Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3062106	Sec 2 Blk XIII Town of Moeraki (SO 14583) 0.3541	FALSE	TRUE	VL
3016501	Lot 33 DP 11746 0.0809	FALSE	TRUE	VL
3030481	Pt Sec 11 Blk I Town of Moeraki (SO 14578) DCDB Document Id: CT 383/6 0.1012	FALSE	TRUE	H
3162986	Crown Land Blk VII Town of Moeraki	FALSE	TRUE	H
3021787	Sec 10 Blk XVI Moeraki Survey District (ML 66) (5.5897)	FALSE	TRUE	VL
3009188	Sec 6A Blk XVI Moeraki Survey District (ML 75) DCDB Document Id: CT 7B/505 (11.2212)	FALSE	TRUE	L
3104429	Sec 9 Blk XVII Town of Moeraki (SO 13154) 1.6567	TRUE	TRUE	VH
3030787	Sec 32 Blk XVI Town of Moeraki (SO 14576) 0.9181	TRUE	TRUE	H
6905247	Lot 8 DP 378138 2.7263	FALSE	FALSE	VL
6630981	Lot 1 DP 21860 1.239	TRUE	TRUE	H
3009096	Sec 9 Blk XVI Moeraki Survey District (ML 66) 3.1363	FALSE	TRUE	VL
6728048	Lot 7 DP 342272 4.009	TRUE	TRUE	H
3069589	Sec 77 Blk I Moeraki Survey District (ML 40) 5.3014	TRUE	TRUE	H
3081353	Sec 1A Blk XVI Moeraki Survey District (ML 68) 2.3194	FALSE	TRUE	H
3001988	Sec 69 Blk I Moeraki Survey District (ML 40) 3.2602	FALSE	TRUE	H
3168250	Pt Sec 22 Blk I Moeraki Survey District (DP 2544, SO 1111) (3.6786)	FALSE	TRUE	None
3158553	Sec 20 Blk I Town of Moeraki (SO 14576) 0.9358	TRUE	TRUE	VH
3094765	Sec 7 Blk XIV Town of Moeraki (SO 9381, SO 14583) 6.3738	TRUE	TRUE	H
3016389	Sec 14 Blk III Town of Moeraki (SO 14576) 1.1619	TRUE	TRUE	VH
3137639	Sec 31 Blk XVI Town of Moeraki (SO 14576) 0.9131	TRUE	TRUE	H
6728053	Lot 4 DP 342272 4.087	TRUE	FALSE	H
6728052	Lot 3 DP 342272 2.2	TRUE	TRUE	H
3104436	Pt Sec 3 Blk XVI Moeraki Survey District (ML 66) (8.146)	TRUE	TRUE	L
6728055	Lot 6 DP 342272 3.627	TRUE	TRUE	H
6728054	Lot 5 DP 342272 1.951	TRUE	TRUE	H
3122283	Sec 25 Blk XVI Town of Moeraki (SO 14582) 0.7993	TRUE	TRUE	H
7066344	Lot 2 DP 405239 4.6355	TRUE	TRUE	L
3009085	Sec 6B Blk XVI Moeraki Survey District (ML 75) 3.111	FALSE	TRUE	L
7288991	Lot 1 DP 424418 4.0009	FALSE	TRUE	VL
3154018	Lot 6 DP 2544 CFR OT2C/841 101.7676	FALSE	TRUE	None
3020533	Pt Sec 2 Blk XVI Moeraki Survey District (ML 66) DCDB Document Id: CT 277/182 (4.2214)	FALSE	TRUE	VL
3158551	Sec 15 Blk II Town of Moeraki (SO 14576) 1.8464	TRUE	TRUE	VH
3052155	Sec 74 Blk I Moeraki Survey District (ML 40) 4.0469	TRUE	TRUE	H
7288993	Lot 3 DP 424418 4	FALSE	TRUE	VL
7288994	Lot 4 DP 424418 4.0004	FALSE	TRUE	VL
6630982	Lot 2 DP 21860 3.427	TRUE	TRUE	H
3084415	Sec 75A Blk I Moeraki Survey District (ML 43) 1.3405	TRUE	TRUE	H
6905244	Lot 5 DP 378138 3.0057	FALSE	TRUE	M
6728062	Lot 14 DP 342272 1.859	FALSE	TRUE	VL
3077869	Sec 1B Blk XVI Moeraki Survey District (ML 68) 1.8059	FALSE	TRUE	H
3115928	Sec 11B Blk XVI Moeraki Survey District (SO 9304) 1.73	FALSE	TRUE	VL
3080500	Sec 2 Sec 75B Blk I Moeraki Survey District (ML 43) 2.5116	TRUE	TRUE	H
3036357	Crown Land Blk I Moeraki SD	TRUE	TRUE	H
6856942	Lot 2 DP 361757 0.8243	FALSE	TRUE	VL
3121649	Sec 5A Blk XVI Moeraki Survey District (ML 322) 0.8916	FALSE	TRUE	L
3153916	Sec 76 Blk I Moeraki Survey District (ML 40) 4.0469	TRUE	TRUE	H
3118978	Sec 71 Blk I Moeraki Survey District (ML 40) 3.2375	TRUE	TRUE	H
6821588	Lot 2 DP 358952 25.24	FALSE	TRUE	VL
6856941	Lot 1 DP 361757 1.649	FALSE	TRUE	VL
3122694	Sec 16 Blk I Moeraki Survey District (SO 1111) 31.2291	FALSE	TRUE	None
6905246	Lot 7 DP 378138 1.367	TRUE	TRUE	H
3051680	Sec 4 Blk XVI Moeraki Survey District (ML 66) 4.5021	TRUE	TRUE	L
3015428	Sec 1 SO 23644 1.1885	TRUE	TRUE	H
3126252	Sec 62 Blk I Moeraki Survey District (ML 41) 4.1809	FALSE	TRUE	VL
3158651	Pt Sec 61 Blk I Moeraki Survey District (ML 41) 9.3171	TRUE	TRUE	H
3149072	Pt Sec 1 Sec 15 Blk I Moeraki Survey District (SO 1111) DCDB Document Id: CT 271/94 (12.8741)	TRUE	TRUE	H
3084485	Pt Sec 86 Blk I Moeraki Survey District (SO 1111, SO 24900) 5.8624	TRUE	TRUE	H
7288992	Lot 2 DP 424418 4.0008	FALSE	TRUE	VL

3075826	Pt Sec 20 Blk XVI Town of Moeraki (SO 14576) 0.7575	TRUE	TRUE	H
3106957	Pt Sec 86 Blk I Moeraki Survey District (SO 1111, SO 24900) 3.1449	FALSE	TRUE	VL
6905245	Lot 6 DP 378138 1.4863	TRUE	TRUE	H
3079673	Sec 29 Blk XVI Town of Moeraki (SO 14576) 1.0269	TRUE	TRUE	H
3084788	Sec 33 Blk XVI Town of Moeraki (SO 14576) 0.8094	TRUE	TRUE	H
3045585	Sec 72 Blk I Moeraki Survey District (ML 40) 3.2375	FALSE	TRUE	VL
3168200	Pt Sec 20 Blk I Moeraki Survey District (DP 2544, SO 1111) DCDB Document Id: CT 203/213 (3.719)	FALSE	TRUE	VL
3147783	Sec 8 Blk XVI Moeraki Survey District (ML 66) 3.1793	FALSE	TRUE	VL
3101161	Pt Sec 2 Blk XVI Moeraki Survey District (ML 66) DCDB Document Id: CT 277/183 (2.9061)	FALSE	TRUE	VL
3116213	Sec 26 Blk XVI Town of Moeraki (SO 14582) 1.0193	TRUE	TRUE	H
3089957	Sec 35 Blk XVI Town of Moeraki (SO 14576) 2.2005	TRUE	TRUE	VH
3094711	Sec 8 Blk XIII Town of Moeraki (SO 14583) 0.4047	FALSE	FALSE	VL
3104756	Sec 11 Blk XIII Town of Moeraki (SO 14583) 0.4047	FALSE	TRUE	VL
3062107	Sec 2 Town of Moeraki (ML 69) 0.2529	FALSE	TRUE	L
3019356	Sec 49 Blk XVI Moeraki Survey District (ML 66) 0.1012	FALSE	TRUE	VL
3051940	Sec 10 Blk XIII Town of Moeraki (SO 14583) 0.4047	FALSE	TRUE	VL
3116865	Sec 7B1 Blk XVI Moeraki Survey District (ML 324) 0.5438	FALSE	FALSE	L
3019243	Sec 4 Blk XIII Town of Moeraki (SO 14583) 0.4553	FALSE	TRUE	VL
3137510	Sec 3 Blk XIII Town of Moeraki (SO 14583) 0.4047	FALSE	TRUE	VL
3021690	Sec 11A Blk XVI Moeraki Survey District (SO 9304) 0.3693	FALSE	TRUE	VL
3019247	Sec 9 Blk XIII Town of Moeraki (SO 14583) 0.4047	FALSE	FALSE	VL
6901099	Sec 2 SO 371002 0.0256	TRUE	TRUE	VH
3058893	Lot 21 DP 11746 0.0832	FALSE	TRUE	H
3061824	Lot 35 DP 11746 0.0809	FALSE	TRUE	VL
3077614	Sec 8 Blk VIII Town of Moeraki (SO 12738) 0.0883	FALSE	TRUE	H
3101971	Lot 15 DP 11746 0.0809	FALSE	FALSE	H
3115755	Pt Sec 1 Sec 15 Blk I Moeraki Survey District (SO 1111) DCDB Document Id: CT 271/94 (12.8741)	FALSE	TRUE	VL
3058215	Sec 1 Blk IV Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3144381	Sec 12 Blk VI Town of Moeraki (SO 14576) 0.0809	FALSE	TRUE	H
3052148	Sec 2 Blk IX Town of Moeraki (SO 14579) 0.1012	TRUE	TRUE	H
6502766	Lot 1 DP 300183 0.0673	FALSE	TRUE	H
3034814	Sec 11 Blk VIII Town of Moeraki (SO 13188) 0.0865	FALSE	TRUE	H
7008527	Lot 7 DP 395321 0.0671	FALSE	TRUE	H
6530228	Lot 2 DP 303573 0.074	FALSE	TRUE	H
3116245	Sec 4 Blk I Town of Moeraki (SO 14578) 0.1012	TRUE	TRUE	H
3034531	Sec 12 Blk I Town of Moeraki (SO 14578) DCDB Document Id: CT 404/139 0.1012	FALSE	TRUE	H
3058452	Sec 4 Blk VI Town of Moeraki (SO 14576) 0.0986	TRUE	TRUE	H
6757816	Lot 1 DP 349194 0.3389	TRUE	TRUE	H
3010591	Sec 7 Sec 17 Blk I Moeraki Survey District (SO 5788) 0.2352	FALSE	TRUE	VL
3073184	Sec 2 Blk II Town of Moeraki (SO 14578) 0.1012	FALSE	TRUE	H
3094423	Sec 12 Blk XVI Town of Moeraki (SO 14582) 0.731	FALSE	TRUE	H
6518341	Lot 1 DP 301874 0.2874	TRUE	TRUE	H
3145745	Sec 8 Blk VI Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
3058934	Lot 20 DP 11746 0.1163	TRUE	TRUE	H
3162976	Sec 4 Blk VII Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
3158895	Sec 16 Blk I Town of Moeraki (SO 14578) 0.1012	TRUE	TRUE	H
3120343	Sec 13 Blk VIII Town of Moeraki (SO 13188) 0.0774	FALSE	TRUE	H
3015469	Sec 3 Blk III Town of Moeraki (SO 14576) 0.0986	TRUE	TRUE	VH
3094905	Lot 11 DP 11746 0.083	TRUE	TRUE	VH
3036820	Sec 10 Blk II Town of Moeraki (SO 14578) 0.1037	FALSE	TRUE	H
6840113	Lot 3 DP 360969 0.0815	FALSE	TRUE	H
6837311	Lot 3 DP 363564 0.1092	TRUE	FALSE	H
3104433	Sec 12 Blk V Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
6930264	Lot 1 DP 361805 0.099	FALSE	TRUE	H
3120336	Sec 10 Blk VIII Town of Moeraki (SO 13188) 0.0938	FALSE	TRUE	H
3047776	Sec 2 Sec 17 Blk I Moeraki Survey District (SO 5788) 0.1163	FALSE	TRUE	VL
6753304	Sec 1 SO 349592 0.0249	FALSE	TRUE	M
6795350	Lot 1 DP 357219 0.2294	FALSE	TRUE	H
7049962	Lot 4 DP 395228 0.0239	TRUE	TRUE	H
3027067	Sec 8 Sec 17 Blk I Moeraki Survey District (SO 5788) 0.2327	FALSE	TRUE	VL
3120335	Sec 16 Blk VIII Town of Moeraki (SO 13188) 0.023	FALSE	TRUE	H
3058720	Sec 5 Blk XIII Town of Moeraki (SO 14583) 0.5792	FALSE	TRUE	VL
6530227	Lot 1 DP 303573 0.0757	FALSE	TRUE	H
3094904	Lot 3 DP 11746 0.0809	FALSE	TRUE	VL
3034812	Crown Land Blk VII Town of Moeraki	FALSE	FALSE	H
7261096	Lot 1 DP 428541 0.2917	TRUE	TRUE	H
3120334	Sec 8 Blk VII Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H

3115342	Sec 1 Blk V Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3061925	Sec 3 Blk IV Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3144766	Sec 46 Blk XVI Moeraki Survey District (ML 66) 0.1012	TRUE	TRUE	L
3113364	Sec 17 Blk VIII Town of Moeraki (SO 16916) 0.0301	FALSE	TRUE	H
7033701	Sec 1 SO 398658 0.0519	FALSE	TRUE	H
3051935	Sec 12 Blk XIII Town of Moeraki (SO 14583) 0.4274	FALSE	TRUE	VL
3018957	Sec 6 Blk V Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3083704	Lot 1 DP 15623 0.0876	TRUE	TRUE	H
6903435	Sec 1 SO 379046 0.0411	FALSE	TRUE	H
3077595	Sec 25 Blk VII Town of Moeraki (SO 14585) 0.005	FALSE	TRUE	H
3158866	Sec 1 Blk XV Town of Moeraki (SO 14576) 0.2555	FALSE	TRUE	VL
3137711	Sec 2 Blk XVII Town of Moeraki (SO 12579) 0.0898	FALSE	TRUE	H
3154581	Lot 1 DP 16948 0.1198	FALSE	TRUE	VL
3051943	Sec 1 Blk IX Town of Moeraki (SO 14579) 0.1012	FALSE	TRUE	H
3019061	Sec 4 Blk III Town of Moeraki (SO 14576) 0.1017	TRUE	TRUE	VH
3126549	Sec 4 Sec 17 Blk I Moeraki Survey District (SO 5788) 0.1391	FALSE	TRUE	VL
3089726	Lot 1 DP 17885 0.0906	TRUE	TRUE	H
7049961	Lot 3 DP 395228 0.1351	TRUE	TRUE	H
3034811	Sec 28 Blk VII Town of Moeraki (SO 14576) 0.6576	FALSE	TRUE	H
3158092	Lot 1 DP 21232 0.135	FALSE	TRUE	H
3034783	Sec 23 Blk VII Town of Moeraki (SO 14585) 0.0025	FALSE	TRUE	H
6706230	Lot 2 DP 336641 0.1358	TRUE	TRUE	H
3030447	Sec 1 Blk II Town of Moeraki (SO 14578) 0.1012	FALSE	TRUE	H
3018958	Sec 5 Blk V Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
6901100	Sec 3 SO 371002 0.0192	FALSE	TRUE	H
3162943	Sec 7 Blk VII Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
6518342	Lot 2 DP 301874 0.5192	FALSE	TRUE	M
3104371	Sec 6 Blk XV Town of Moeraki (SO 14576) 0.4022	FALSE	TRUE	VL
3038167	Sec 643R Blk I Moeraki Survey District (SO 1111, SO 2699) 0.1163	FALSE	TRUE	None
6795352	Lot 3 DP 357219 0.2422	FALSE	TRUE	H
3030053	Lot 1 DP 11016 0.0809	TRUE	TRUE	H
3144741	Lot 2 DP 10621 0.1012	TRUE	TRUE	H
3144772	Sec 7 Blk VI Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
3052162	Lot 32 DP 11746 0.1497	FALSE	TRUE	H
3120316	Sec 20 Blk VII Town of Moeraki (SO 14585) 0.0076	FALSE	TRUE	H
3052164	Lot 10 DP 11746 0.083	TRUE	TRUE	VH
7112206	Lot 2 DP 407582 0.1256	FALSE	TRUE	M
3147181	Sec 11 Blk V Town of Moeraki (SO 14576) 0.1012	TRUE	FALSE	H
3056022	Sec 24 Blk XVI Town of Moeraki (SO 14582) 0.6247	TRUE	TRUE	H
3058295	Sec 9 Blk XV Town of Moeraki (SO 14576) 0.2706	FALSE	TRUE	VL
6747066	Lot 1 DP 344726 0.1344	TRUE	TRUE	VH
3061838	Sec 5 Blk IX Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
7008528	Lot 9 DP 395321 0.3315	TRUE	TRUE	H
3077629	Sec 19 Blk VII Town of Moeraki (SO 14585) 0.0152	FALSE	TRUE	H
3155742	Pt Sec 2 Sec 15 Blk I Moeraki Survey District (SO 1111, SO 24305) 0.4012	FALSE	TRUE	VL
3120319	Sec 18 Blk VII Town of Moeraki (SO 14585) 0.0051	FALSE	TRUE	H
6785174	Lot 1 DP 354601 0.0806	TRUE	TRUE	H
3051984	Sec 18 Blk V Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	VL
3002161	Sec 1 Sec 75B Blk I Moeraki Survey District (ML 43) 0.1695	TRUE	TRUE	H
3115156	Lot 2 DP 21232 0.1033	FALSE	TRUE	H
3052165	Lot 14 DP 11746 0.0809	FALSE	TRUE	H
3168626	Lot 2 DP 24650 0.491	FALSE	TRUE	VL
6785175	Lot 2 DP 354601 0.1321	TRUE	FALSE	H
3009210	Lot 13 DP 11746 0.0809	FALSE	TRUE	H
7008523	Lot 2 DP 395321 0.0818	TRUE	TRUE	H
3096195	Sec 3 Blk XVI Town of Moeraki (SO 14582) 0.4123	FALSE	TRUE	VL
3104588	Sec 1 Blk III Town of Moeraki (SO 14576) 0.1214	FALSE	TRUE	VH
3167500	Lot 9 DP 11746 0.0809	TRUE	TRUE	VH
3158863	Sec 2 Blk XV Town of Moeraki (SO 14576) 0.2706	FALSE	TRUE	VL
3136529	Sec 7 Blk XVI Town of Moeraki (SO 14582) 0.5008	FALSE	TRUE	VL
3061834	Sec 9 Blk VI Town of Moeraki (SO 14576) 0.1037	FALSE	TRUE	H
3143550	Sec 1 SO 23380 0.4831	TRUE	FALSE	H
3061831	Sec 4 Blk XVII Town of Moeraki (SO 12579) 0.1462	FALSE	TRUE	H
3104424	Lot 5 DP 11746 0.0812	FALSE	TRUE	VL
3120337	Sec 6 Blk VII Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3157746	Sec 10 Blk IV Town of Moeraki (SO 14576) 0.1062	FALSE	FALSE	H
3104739	Lot 3 DP 10377 0.0911	TRUE	TRUE	H

6648263	Lot 2 DP 324203 0.1746	FALSE	TRUE	H
3006964	Sec 10 Blk I Town of Moeraki (SO 14578) 0.1012	FALSE	TRUE	H
3077610	Sec 29 Blk VII Town of Moeraki (SO 12356) 0.0025	FALSE	TRUE	H
3116217	Sec 3 Blk V Town of Moeraki (SO 14576) 0.1012	TRUE	TRUE	H
3062093	Lot 2 DP 10377 0.0809	TRUE	TRUE	H
6741080	Lot 1 DP 345610 0.1608	FALSE	TRUE	H
3144747	Sec 14 Blk VI Town of Moeraki (SO 14576) 0.1012	FALSE	TRUE	H
3061836	Sec 1 Town of Moeraki (ML 69) 0.2428	FALSE	TRUE	L
3116143	Sec 7 Blk XIII Town of Moeraki (SO 14583) 0.4376	FALSE	TRUE	VL
3009009	Sec 6 Blk XIII Town of Moeraki (SO 14583) 0.4755	FALSE	TRUE	VL
3144768	Sec 3 Town of Moeraki (ML 69) 0.2428	FALSE	TRUE	L
3137221	Sec 15 Blk XVI Moeraki Survey District (ML 66) 1.8742	FALSE	TRUE	L
3066002	Sec 18 Blk XVI Moeraki Survey District (ML 66) 0.9864	FALSE	TRUE	VL
3137740	Sec 7B2 Blk XVI Moeraki Survey District (ML 324) (4.5932)	FALSE	FALSE	L
3103840	Sec 7B2 Blk XVI Moeraki Survey District (ML 324) (4.5932)	TRUE	FALSE	L
6728058	Lot 10 DP 342272 2.0493	FALSE	TRUE	VL
3021776	Sec 12 Blk XVI Moeraki Survey District (ML 66) 1.859	FALSE	TRUE	VL
3001857	Pt Sec 13 Blk XVI Moeraki Survey District (ML 66) DCDB Document Id: CT 7B/504 (6.074)	FALSE	TRUE	VL
3114914	Sec 7A Blk XVI Moeraki Survey District (ML 324) 1.1761	TRUE	TRUE	L
3101182	Lot 2 DP 18457 1.047	TRUE	TRUE	L
3059307	Lot 1 DP 18457 1.2	TRUE	TRUE	L