

# Actuarial Review of Canterbury Earthquake Losses Claim Liabilities as at 30 June 2011

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**AMI Insurance Limited**

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**August 2011**

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17 August 2011

Mr Kieran Sweetman  
Executive Manager - Finance  
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NEW ZEALAND

Dear Kieran

**Actuarial Review of Earthquake Claims Liabilities  
for AMI Insurance at 30 June 2011**

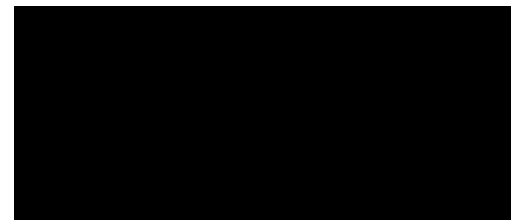
We are pleased to enclose our report in respect of the valuation of AMI's liabilities for claims arising from the series of earthquake events which hit the Canterbury region in the period since 4 September 2010. Note that AMI's other insurance liabilities are covered in the separate report "Actuarial Review of Business As Usual Liabilities" dated August 2011.

This valuation has been prepared in compliance with the International Financial Reporting Standards which are applicable in New Zealand and the liabilities are suitable for inclusion in AMI's NZ IFRS 4 balance sheet. It has also been conducted in accordance with the Institute of Actuaries of Australia Professional Standard 300 and Professional Standard 4 issued by the New Zealand Society of Actuaries.

Please do not hesitate to contact us if you wish to discuss any aspect of this report.

Yours sincerely

withheld pursuant to section 9(2)(a)



Fellows of the Institute of Actuaries of Australia



# Actuarial Review of Earthquake Liabilities as at 30 June 2011

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## Part I Executive Summary

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### 1 Purpose and Scope

We have been asked by AMI Insurance Limited (AMI) to make an assessment of its earthquake claims (“EQ”) liabilities as at 30 June 2011 and also at 7 April 2011. Our report “Actuarial Review of Business As Usual Liabilities” dated August 2011 covers the valuation of AMI’s “business as usual” liabilities and should be read in conjunction with this report.

The purpose of this report is to assist AMI in setting their outstanding claims provisions for balance sheet purposes in accordance with the International Financial Reporting Standards (IFRS). As such, the assessment of the claims liabilities included in this report is intended to comply with IFRS, in particular the New Zealand standard “New Zealand Equivalent to International Financial Reporting Standard 4, Insurance Contracts”, referred to as NZ IFRS 4.

In addition, we understand that the liabilities included in this report will be used in AMI’s reporting to New Zealand Treasury and the Reserve Bank of New Zealand in accordance with the terms of the Crown Deed provided to AMI by the New Zealand Government (see below).

In our opinion, the valuation of AMI’s EQ liabilities has been prepared on a basis which is in accordance with Professional Standard 300 issued by the Institute of Actuaries of Australia, and also with Professional Standard 4 issued by the New Zealand Society of Actuaries (noting that PS4 is not mandatory for these classes of business).

### 2 Background

On 4 September 2010, a magnitude 7.1 earthquake centred at Darfield (to the west of Christchurch CBD) occurred, producing widespread damage. In the period since, a further 8 separate earthquake events have been individually identified by AMI, with the events on 22 February 2011 (magnitude 6.3 at Lyttleton) and 13 June 2011 (magnitude 6.3 at Sumner) being the two others to produce material levels of damage. We have classified these three events as ‘major’, with the other 6 grouped as ‘minor’.

In early April 2011, when it became apparent that the loss from the 22 February event was likely to materially exceed AMI’s reinsurance cover and put at risk AMI’s solvency, AMI entered into an agreement with the New Zealand Government (“the Crown Deed”) whereby AMI was provided with a \$500m facility to replenish its capital base.

Under the terms of the Crown Deed, AMI became immediately subject to the draft solvency standards being developed by the Reserve Bank of New Zealand (“RBNZ”). In addition, AMI effectively became a Crown entity, meaning that its financial position is now incorporated into the accounting of Government business. The provisions included in this report are intended to be consistent with the basis required for this purpose.

### 3 Approach to the Valuation

At a high level, the calculation of AMI's liability for each event relies on a relatively small number of parameters for each of the covers for earthquake damage provided under AMI's various products, namely the ultimate number of claims and the ultimate average claim size. Our approach has been specifically designed to deal with the complications caused by many properties suffering damage from more than one event and how the cover provided by EQC will perform in these circumstances. Section 2 of our detailed findings sets out a full description of how we have dealt with these issues.

Our adopted assumptions for these parameters have been based on the patterns emerging in AMI's reported experience for these events with particular emphasis on the experience depicted by the detailed rebuild/repair assessments which had been completed up until 26 July 2011.

### 4 EQ Liabilities at 30 June 2011

Table 1 summarises our estimates of AMI's EQ liabilities at 30 June 2011, with each of the three major events shown separately. Note that the figures in the body of the table are net of payments made in the period to 30 June 2011. The line below the table indicates our estimate of the total amount which will ultimately be paid once all claims are settled (including payments already made). Our recommended provisions incorporate a risk margin which we believe to be consistent with the requirement to establish provisions which incorporate at least 75% probability of sufficiency.

**Table 1 – Recommended EQ Provisions at 30 June 2011**

Provisions for Outstanding Claims as at 30 June 2011	Cat 93	Cat 106	Cat 112	Total		
	4-Sep-10 \$m	22-Feb-11 \$m	13-Jun-11 \$m	Major \$m	Minor \$m	Overall \$m
<b>Gross Outstanding Claims</b>						
In 30 June 2011 Values	515	1,000	83	1,597	17	1,615
Allowance for Future Inflation	29	53	4	87	1	88
Inflated Values	544	1,053	87	1,684	18	1,702
Discount to Present Value	-29	-56	-5	-90	-1	-90
<b>OSC Discounted to 30 June 2011</b>	<b>516</b>	<b>996</b>	<b>82</b>	<b>1,595</b>	<b>17</b>	<b>1,612</b>
Claims Handling						
<b>Gross Central Estimate</b>						
Catastrophe R/I Recoveries	-531	-572	-72	-1,176	-7	-1,183
Aggregate R/I Recoveries	0	-2	-4	-6	-2	-8
<b>Net Central Estimate</b>	<b>0</b>	<b>452</b>	<b>9</b>	<b>461</b>	<b>9</b>	<b>469</b>
Risk Margin						
<b>Recommended provision</b>						
<b>Inflated Gross Central Estimate (Incl paid to date + CHE)</b>	<b>595</b>	<b>1,090</b>	<b>89</b>	<b>1,774</b>	<b>19</b>	<b>1,793</b>

withheld under section 9(2)(b)(ii)

Our overall recommended provision for AMI's EQ liabilities, net of reinsurance recoveries, at 30 June 2011 is \$687m. Key points to note include:

- Across all events, our gross central estimate of the AMI's EQ liabilities at 30 June 2011 (before adding claims handling expense) is \$1,612m, with \$1,595m relating to the three major events and \$17m relating to the six minor events
- The allowance for claims handling is based on a loading of 3% of the discounted gross outstanding claims; it encompasses the projected cost of AMI's earthquake claims operation ("CeMAT") of \$32m, together with an amount of \$18m to cover the portion of Arrow International's overall assessment and project management costs which were not included in the individual assessment data supplied to us for this valuation
- As the line of figures underneath the table indicates:
  - ▶ Cat 93 (the 4 September 2010 event) is currently estimated to ultimately cost \$595m (in inflated \$); as such this event is very close to the limit of the amount of reinsurance cover purchased for this event (\$600m)
  - ▶ Cat 106 (the 22 February 2011 event) has an estimate (in inflated \$) of \$1,090m, which is well in excess of the available reinsurance cover of \$600m
  - ▶ Cat 112 (the 13 June 2011 event) has an estimated inflated cost of the order of \$89 million, which falls well below the maximum reinsurance cover for this event of \$1,000m
- The present value of recoveries expected to be made from AMI's reinsurance covers total \$1,191m, with \$1,183m coming from the main catastrophe programme and \$8m coming from the three aggregate covers which were in place for various periods of time during which these events occurred
- After deduction of reinsurance recoveries, across all events, our net central estimate of AMI's EQ liabilities is \$469m, with the majority of this (\$452m) being due to the loss from the 22 February 2011 event going through the top of the reinsurance cover available for this event
- Our recommended provisions incorporate risk margins of \$218m; this is calculated as 14.2% of our gross central estimate of liabilities, but noting that to the extent that the assessed loss for an event is expected to fall below the available reinsurance cover, the risk margin is offset by a potential reinsurance recoverable; this applies to the September event (\$4m) and to the June 2011 event (\$12m).

## 5 Key Assumptions

Table 2 sets out a summary of the key assumptions we have made about the claim numbers and average claim sizes for the three major events. Note that the costs are expressed in 30 June 2011 values. The sizes and costs shown for Over Cap claims is net of estimated EQC contributions.

**Table 2 – Major Events -Summary of Claims Assumptions**

Cover Type	04 September 2010			22 February 2011			13 June 2011		
	Ultimate No of Claims	Average Size \$000	Total Cost \$m	Ultimate No of Claims	Average Size \$000	Total Cost \$m	Ultimate No of Claims	Average Size \$000	Total Cost \$m
<b>Over Cap</b>	2,060	203	418	3,900	194	755	300	190	57
<b>Out of Scope</b>	9,440	9	87	11,000	15	165	1,360	15	20
	11,500	44	505	14,900	62	920	1,660	47	77
<b>Lost Rent</b>	240	9	2	585	12	7	50	16	1
<b>Temp Accom</b>	2,400	15	35	3,300	17	55	200	17	3
<b>Contents</b>	600	8	5	1,600	15	24	60	12	1
<b>Vehicles</b>	1,130	1	1	2,100	3	5	180	2	0
<b>Other</b>	70	10	1	35	10	0	12	6	0
	4,440	10	44	7,620	12	92	502	10	5
<b>Total</b>	<b>15,940</b>	<b>34</b>	<b>549</b>	<b>22,520</b>	<b>45</b>	<b>1,011</b>	<b>2,162</b>	<b>38</b>	<b>83</b>

Other key assumptions not already covered in earlier commentary include:

- a payment pattern which allows for around 70%-75% of AMI's gross liability to be paid over the course of the next 2 years, with the remainder to spread out until FY2017. This pattern assumes that the Government's land remediation package, together with the desire of some claimants not to "wait their turn in the queue", will lead to a fairly material number of cash settlements occurring – and, of course, a good proportion of those that are repairs and those who choose to rebuild will be commenced within the next 12-24 months
- Future claims inflation of:
  - ▶ 6% per annum for buildings costs, which is based on advice from Treasury
  - ▶ 0% for Lost Rent and Temporary Accommodation where the adopted sizes for these covers have been set at the maximum payable under AMI's cover
  - ▶ 3% per annum for other cover types, consistent with general levels of economic inflation
- Discount rates which match risk free zero coupon yields published by New Zealand Treasury; these rates increase from 2.74% per annum for FY12 cashflows through to 4.58% per annum for FY17 cashflows.

## 6 Uncertainty

At the point in time of preparing this valuation, it must be stressed that a relatively large degree of uncertainty attaches to our estimates of AMI's EQ liabilities. As noted above, in recognition of this uncertainty, we have incorporated a risk margin of 14.2% in our recommended provisions – a level which is intended to produce a 75% probability of sufficiency. This margin is considerably higher than the margins applying to AMI's other claim liabilities and is based largely on subjective judgements as to the appropriate margin to apply.

In Section 7 of our Detailed Findings we set a series of sensitivity tests on our valuation results. These results indicate that reasonably modest adjustments to the main

parameters in our valuation can cause movements of +/- \$50m in the net central estimate of AMI's EQ liabilities. This indicates that, as the experience matures, deviations of this order in the estimated cost of these events should be viewed as normal. By the same token, testing of quite adverse development in the experience shows that it would require simultaneous and quite severe deterioration across a combination of parameters to produce a result which more than extinguishes the risk margin allowed for in our recommended provisions.

## **7 EQ Liabilities at 7 April 2011**

A table setting out equivalent recommended provisions as at 7 April 2011 is included in Section 7 of our Detailed Findings.

## **8 Reliances and Limitations**

The reliances and limitations attaching to this advice are an important part of this report and are detailed in Section 8.

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## Part II Detailed Findings

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### 1 Introduction

#### 1.1 Purpose and Scope

We have been asked by AMI Insurance Limited (AMI) to make an assessment of its earthquake claims ("EQ") liabilities as at 30 June 2011 and also at 7 April 2011. Our report "Actuarial Review of Business As Usual Liabilities" dated August 2011 covers the valuation of AMI's "business as usual" liabilities and should be read in conjunction with this report.

The purpose of this report is to assist AMI in setting their outstanding claims provisions for balance sheet purposes in accordance with the International Financial Reporting Standards (IFRS). As such, the assessment of the claims liabilities included in this report is intended to comply with IFRS, in particular the New Zealand standard "New Zealand Equivalent to International Financial Reporting Standard 4, Insurance Contracts", referred to as NZ IFRS 4.

In addition, we understand that the liabilities included in this report will be used in AMI's reporting to the New Zealand Treasury and Reserve Bank of New Zealand in accordance with the terms of the Crown Deed provided to AMI by the New Zealand Government (see below).

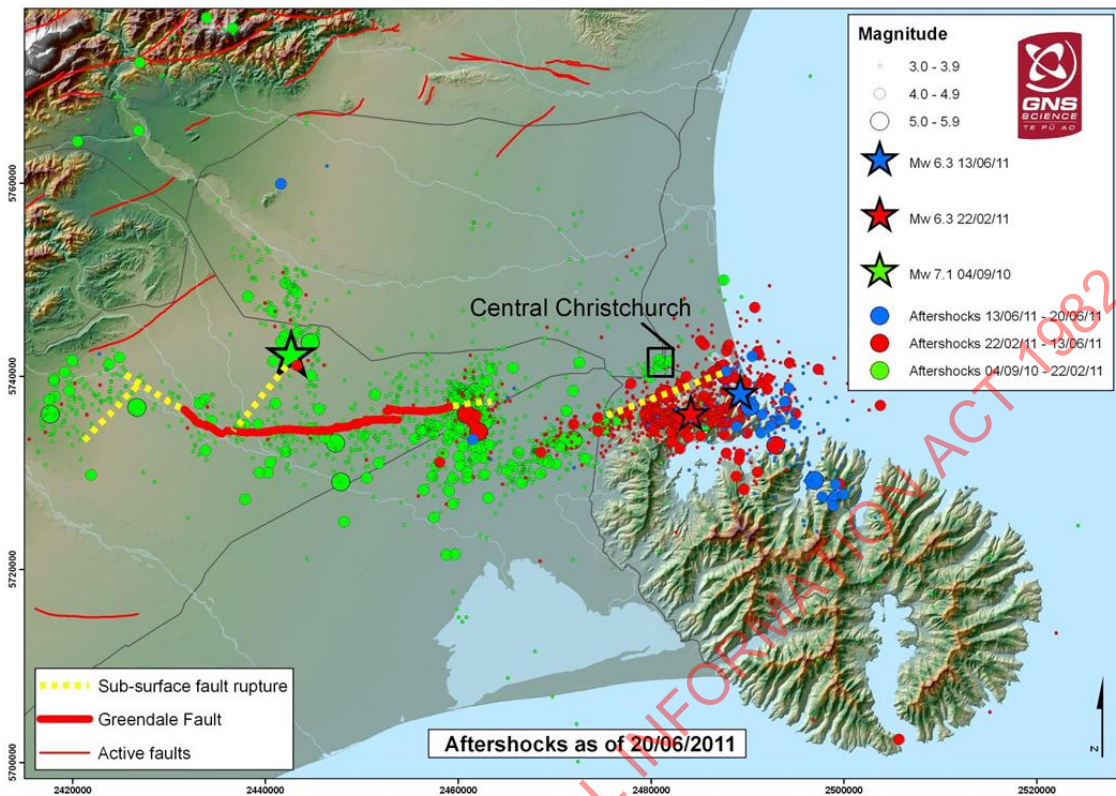
In our opinion, the valuation of AMI's EQ liabilities has been prepared on a basis which is in accordance with Professional Standard 300 issued by the Institute of Actuaries of Australia, and also with Professional Standard 4 issued by the New Zealand Society of Actuaries (noting that PS4 is not mandatory for these classes of business).

#### 1.2 The Canterbury Earthquake Events

On 4 September 2010, a magnitude 7.1 earthquake centred at Darfield (to the west of Christchurch) occurred, producing widespread damage. In the period since, a further 8 separate earthquake events have been individually identified by AMI, with the events on 22 February 2011 (magnitude 6.3 at Lyttleton) and 13 June 2011 (magnitude 6.3 at Sumner) being the two others to produce material levels of damage. We have classified these three events as 'major', with the other 6 grouped as 'minor'.

Figure 1.1 is a map produced by GNS showing the areas where there has been seismic activity in the period since the September 2010 event.

Figure 1.1 – Seismic Activity Around Christchurch Since September 2010



### 1.3 AMI’s Financial Position

In early April 2011, when it became apparent that the loss from the 22 February event was likely to materially exceed AMI’s reinsurance cover and put at risk AMI’s solvency, AMI entered into an agreement with the New Zealand Government (“the Crown Deed”) whereby AMI was provided with a \$500m facility to replenish its capital base.

Under the terms of the Crown Deed, AMI became immediately subject to the draft solvency standards being developed by the Reserve Bank of New Zealand (“RBNZ”). In addition, AMI effectively became a Crown entity, meaning that its financial position is now incorporated into the accounting of Government business. The provisions included in this report are intended to be consistent with the basis required for this purpose.

### 1.4 Nature of the Estimates

The estimates of outstanding claims in this report have been prepared initially on a *central estimate* basis. The valuation assumptions have been selected such that the estimates of these liabilities contain no deliberate overstatement or understatement. The central estimate is intended to be a mean of the distribution of outcomes.

The liability cannot be estimated with certainty due to, among other things, random fluctuations in experience and changes in the external environment. Because of this uncertainty, we believe that balance sheet provisions should include a risk margin above the central estimate. Risk margins are discussed further in Section 5.5.

Under NZ IFRS 4, insurers must discount expected future claim payments for the time value of money. All results have been estimated gross and net of reinsurance recoveries. All claims data supplied for the valuation was net of GST for all lines of business. The valuation results in this report are, therefore, net of GST.

## 1.5 Control Processes and Review

Our valuation and this report have been subject to Technical and Peer Review as part of Finity's standard internal control process:

- Technical review focuses on the technical work involved in the project. The technical reviewer reviews the data, models, calculations and results, and also reviews our written advice from a technical perspective.
- Peer review is the professional review of a piece of work. The peer reviewer reviews the approach, assumptions and judgments, results and advice.

AMI's internal actuarial team provided us with data manipulated from transactional data in a form suitable for inclusion in our claim projection models. AMI performed a reconciliation of this data to an independent source and this reconciliation has been provided to us and is detailed in Appendix A. We are satisfied with the results of this reconciliation.

## 1.6 Structure of Report

The remainder of this report contains the following:

- Section 2* - describes the approach used to value the outstanding claims liabilities, the data supplied for this valuation and details of reconciliations performed
- Section 3* - documents the analysis of the claim number experience together with our valuation assumptions
- Section 4* - documents the analysis of the average claim size experience together with our valuation assumptions
- Section 5* - set outs other assumptions required to form our recommended provisions for AMI's EQ liabilities
- Section 6* - documents the anticipated reinsurance recoveries associated with the EQ events
- Section 7* - summarises the outstanding claims valuation results at 30 June 2011 and 7 April 2011
- Section 8* - details the reliances and limitations of this report.

The Appendices to this report provide more detail on the data provided, the analysis undertaken and the valuation results.

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## 2 Approach and Information

### 2.1 Introduction

This section describes the information used and describes the general approach we have taken to the EQ liability valuations at both 30 June 2011 and 7 April 2011.

### 2.2 AMI's Coverage for Earthquake damage

AMI provides coverage for damage caused by earthquake under a number of its products, as follows:

#### *House*

- Over Cap Physical Damage
  - ▶ Damage to buildings in excess of the amount covered by the Earthquake Commission ("EQC"), which is currently capped at \$100,000 (excluding GST)
  - ▶ Note that the majority of AMI policies provide for full replacement value and as such do not have specified sums insured
- Out of Scope ("OOS") Physical Damage
  - ▶ Cover for damage to sheds, fences, driveways, swimming pools – which are not covered by EQC
- Loss of Rent
  - ▶ For investment properties, cover for loss of rental income (capped at 6 months) while the building is uninhabitable

#### *Contents*

- Over Cap Damage
  - ▶ Damage to Contents in excess of EQC cover of \$20,000 (excluding GST)
- Temporary Accommodation
  - ▶ The cost of temporary accommodation is covered for up to 12 months and is subject to a maximum of 25% of Contents sum insured (noting that AMI has agreement from reinsurers to extend the period to 12 months from the 6 months specified in its policy wording)

#### *Other products*

- Comprehensive Motor, Farm and Boat - Earthquake related damage covered similarly to other types of damage.

## 2.3 AMI's Claims Recording Practices

By far, the majority of losses under AMI's coverage for earthquake damage relates to over cap and out of scope claims arising under the House product. It is worth noting the way in which AMI records claims against the House product.

In respect of Over Cap damage, for the February 2011 event, AMI established a set of rules based on the customer's description of damage to identify dwellings where the cost was most likely to exceed EQC's \$100k cap. These rules were then "back applied" to the September event to achieve "comparable" claims for the two events. This resulted in a number of claims originally recorded for the September 2010 event effectively being cancelled. There are still a small number of claims in respect of the September event existing in AMI's AMIGO system which would not have been recorded under the February rules. In our valuation, it is assumed that these will eventually be cancelled.

For properties with Over Cap damage which have also suffered OOS damage, the OOS component is incorporated into the Over Cap claim. A small number of cases have been identified where separate claims for Over Cap and OOS have been recorded on the same property for the same event. AMI is in the process of cleansing the claims records for these cases.

Where the damage covered by the EQC is not expected to exceed the EQC cap of \$100k but there is out of scope damage, AMI records an Out of Scope claim against the House policy. It should also be noted that when it becomes clear that an Over Cap claim should only be an OOS claim (and vice versa) then the claim type is amended accordingly in AMIGO.

Where there are claims for either loss of rent under House or temporary accommodation under Contents, the AMIGO system records a separate claim from that recorded for the physical damage claim.

## 2.4 AMI's Claims Estimates

### Over Cap Claims

For the September 2010 event AMI conducted elemental assessments on all Over Cap claims it had received. These represented a rapid assessment of the damage and of the likely cost of repair/rebuild. In the wake of the February 2011 event, AMI took the decision that there was limited value in conducting preliminary loss assessments. Instead AMI decided to concentrate on the programme it had commenced prior to this event of preparing detailed repair / rebuild assessments ("DRA's"). Arrow International ("Arrow") has been contracted to fulfil this function for AMI and also to project manage the resulting repair and rebuild activities. These DRA's provide a very detailed assessment of cost and form the basis of negotiations firstly with claimants and then with building contractors and also with EQC in regard to EQC contributions to the overall cost.

As at 27 July, 1700 DRA's had been completed with the majority of these relating to Over Cap claims which had emerged from the September 2010 event. AMI's prioritisation processes have almost certainly meant that the DRA's completed so far do not represent an unbiased representation of the total pool of Over Cap claims. The data clearly shows some regional differences in the proportions of Over Cap claims with completed DRA's and we also expect that the completed DRA's have been biased towards more seriously damaged houses.

Our assessment of average claim size for Over Cap claims has been based entirely on the emerging experience depicted by the DRA's completed to date. In forming our judgements when selecting assumptions based on the available DRA experience, we have attempted to cater for the possibility that the experience to date may not be representative of the future experience on the remaining DRA's. This is particularly relevant for those properties where the first Over Cap claim has emerged from the February 2011 event.

### Out of Scope Claims

By volume (with over 16,000 properties having reported OOS claims across the two main events and with nearly 1,700 of these having reported OOS claims for both events), these claims represent a sizeable logistical challenge for the handling of AMI's EQ liabilities.

At this stage, we understand that the case estimates recorded in AMIGO for the September 2010 OOS claims reflect the results of recent initiatives to complete assessments of all OOS claims from this event. For February 2011 OOS claims, many of the case estimates in AMIGO are still being held at their default estimate of \$17,400 (excluding GST).

In the process of completing the latest round of assessments for the September claims, feedback from the manager of the OOS claims area, albeit anecdotal in nature, has indicated that:

- A proportion of the OOS claims reported for February appear to be "double up" claims for the same damage as incurred in the September event, or that the additional damage did not increase the repair cost
- Where there is additional damage in February, it appears that generally more than 50% of the damage is still attributable to the September event.

In assessing the emerging OOS experience and in selecting assumptions for this category of claim we have been mindful of this feedback.

### Other Cover Types

For other cover types we have relied directly on the case estimates recorded in AMIGO as the base data for analysis.

## 2.5 Estimation of EQ Liabilities

### General Approach

At a high level, the calculation of AMI's ultimate liability for each event relies on a relatively small number of parameters for each of the covers for earthquake damage provided under AMI's various products:

- Gross Claims Cost (in current \$):
  - ▶ Ultimate number of claims
  - ▶ Ultimate average claim size
- Translating to Recommended Provision
  - ▶ Expected pattern of future payments
  - ▶ Inflate for anticipated future escalation of claims costs
  - ▶ Deduct expected reinsurance recoveries
  - ▶ Discount to present value at risk free rate
  - ▶ Load for claims handling expenses and risk margins.

Our valuation has essentially followed this approach, but with differences in how we have derived our estimates of the ultimate claim numbers and of the ultimate average claim size. Our estimates of outstanding claims at 30 June 2011 are derived by deducting from ultimate costs actual payments made up until 30 June 2011

### Covers Other Than House Physical Damage

For the less significant parts of AMI's losses (Loss of Rent, Contents, Temporary Accommodation, Motor, Farm and Boat) our approach has essentially followed a "traditional" approach, by taking views on how the experience reported to date is likely to develop over future periods. For major events:

- a Chain-ladder (CL) method is used to project the ultimate number of claims for each loss type. This involves deriving chain ladder factors from the experience and then applying a selected factor to the undeveloped accident periods. For the minor events, IBNR claims were subjectively estimated based on the patterns exhibited in the major events.
- An average incurred amount per claim is also projected for each loss type. This involves deriving chain ladder factors for the development of the cumulative average incurred amount per claim from the experience provided for each event. A selected factor is then used to project the average incurred amount for events which have not yet reached full maturity. For minor events we have generally chosen an



average claim size consistent with that implied by the case estimates recorded in AMIGO.

- The ultimate claims cost for each event is determined by multiplying the projected ultimate claim numbers by the ultimate average incurred claim size. Payments to date are deducted to produce the gross current value EQ liability.

### House Physical Damage – September 2010 and February 2011 Events

While the overall valuation of AMI's EQ liabilities for House physical damage essentially follows the same calculation routine set out above, establishing appropriate assumptions for the ultimate number of claims and the ultimate average claim size for each of the two major events is not as straightforward, on a number of accounts:

- The areas of Christchurch damaged by the various events overlap considerably, meaning that many properties have experienced damage from more than one event, thus requiring an allocation of the overall cost of repairs or rebuilding among the events contributing to the damage; this issue predominantly relates to the allocation of damage between the September 2010 and February 2011 events, which is important both in estimating potential EQC contributions and in assessing potential reinsurance recoveries
- The February 2011 earthquake was quite different to September 2010, in location, nature and severity, resulting both in significant damage in areas of Christchurch only mildly affected by the first event as well as quite significant exacerbation of damage in the worst hit areas from September
- The presence of the 'first loss' cover provided by the Earthquake Commission ("EQC"), in combination with multiple events within a short period of time, has complicated both the claims handling processes and the determination of AMI's residual liability on the properties it insures; in addition there is some uncertainty as to how and when the cover provided by EQC reinstates and what process will be used to determine EQC's total contribution where the damage has been caused by multiple events
- The sheer magnitude of the damage involved has created operational and logistical challenges for all insurers; in particular, the volume of claims and the scale of damage involved has meant that it is taking considerable time for the claims assessment process to be completed, meaning that a much larger than normal proportion of claims as yet do not have 'real' case estimates; this is particularly the case for the February 2011 event
- The situation was exacerbated by a Government announcement on 9 June 2011 that it was uneconomic to remediate a substantial number of sections of land (ultimately, expected to be about 10,000 properties); a compensation package involving two options for property owners was also announced, although at the time of undertaking this valuation, the details of how this may play out are not yet clear.

In response to these issues, our approach has been to segment AMI’s House physical damage experience into a number of discrete groups, based on a combination of region and AMI’s recorded claim types for the two events, resulting in 56 segments in total as depicted in Figure 2.1 below.

**Figure 2.1 – Segmentation of House Physical Damage Claims**

Event	Valuation Claim Group								
4-Sep-10	Over Cap	Over Cap	Over Cap	OOS	No Claim	OOS	OOS	No Claim	No Claim
22-Feb-11	Over Cap	OOS	No Claim	Over Cap	Over Cap	No Claim	OOS	OOS	No Claim

X

Valuation Geographic Zones						
Christchurch Hills	Christchurch Red	Christchurch Yellow	Christchurch Green	Christchurch White	Waimak Red / Yellow	All Other Regions

Note that the No Claim / No Claim group effectively represents AMI-insured properties which have not had an AMI claim recorded for either event but have had an EQC claim event recorded on one or both of the 2 events. As such, it is not a segment from which any liability attaches to AMI. The geographic zones align with the land remediation zones announced by the Government on 9 June 2011.

To cater for damage to individual properties being caused by multiple events, our process has been largely based around examining the experience at a property level and then “back-filling” to get claim counts and costs for each of the two events. Our analysis and selection of assumptions is primarily driven by the experience depicted by the completed DRA’s.

**Claim Numbers**

We estimate the overall ultimate number of House physical damage claims (Over Cap and OOS combined) for each major event using the same Chain Ladder technique as described earlier. The ultimate mix between Over Cap and OOS is derived from the results of the detailed segment model – which gives, both for completed and uncompleted DRA’s, an estimate of the number and proportion of Over Cap claims whose cost is ultimately expected to fall below the EQC cap. For these claims we have assumed that they will all revert to being treated by AMI as Out of Scope claims.



### *Cost of Claims*

Our views on the average claim size are largely driven from the trends and patterns present in the completed DRA's. The key pieces of information extracted from each DRA are as follows:

- Whether the claim is a rebuild or repair
- The overall gross cost (excluding GST) of the repair/rebuild
- The split of the gross cost between those elements covered by EQC and those which are outside the scope of EQC cover
- The split of the gross cost between the relevant events (for this valuation the DRA's have only dealt with properties with claims from the September and February events).

The following diagram depicts how the experience recorded on completed DRA's is used to disaggregate the gross cost across events, to estimate the EQC contribution to each event and to derive parameters for estimating the costs of those claims awaiting completion of a DRA. Note that we use the AMI average sum insured as a means of normalising for any variations in the relative value of uncompleted versus completed properties (and noting that, while the sum insured used by AMI appears low relative rebuilding costs indicated by DRA's, testing showed that it represents a reasonable proxy for such scaling). For OOS claims, our average claim size is largely derived from the OOS component in the DRA and from AMI's case estimates on the OOS only claims.

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**Figure 2.2 – Depiction of Parameter Selection Process**

Finity Valuation Segment		Completed DRA's			Claims Awaiting DRAs			Key to Colour Coding	
Geographic Zone Christchurch Hills		Experience to Date			Projected Future			Numbers directly from reported experience	
AMI Claim Types								Derived from reported experience	
Sept / Feb Ov Cap / Ov Cap								Assumptions Made	
								Derived from Assumptions	
<b>Explanatory Comments</b>									
<b>Total No of Reported Claims</b>		34			24				
Mix Implied By DRA		<b>Rebuild</b>	<b>Repair</b>	<b>OOS</b>	<b>Rebuild</b>	<b>Repair</b>	<b>OOS</b>	% Selected based on DRA experience to date	
% of Total		60%	30%	10%	55%	30%	15%		
No of Claims		18	10	6	13	7	3		
Avg Sum Insured \$000		347	293	194	367	367		Sum Insured used for premium Calculations	
Average Gross DRA Cost \$000		622	262	162	661	330	15	calculated as Avg Replace Value * Gross DRA %	
Gross DRA % Sum Insured		179%	89%	84%	180%	90%		Out of Scope Size selected directly from OOS experience	
Avg Cost Covered By EQC \$000		496	206	114	529	248		EQC cover does not extend to all cost components.	
DRA EQC % Gross DRA		80%	79%	70%	80%	75%		Calculation here is to estimate amount EQC covers	
Avg Added AMI Costs \$000		126	55	48	132	83		Difference between Gross & Covered By EQC	
% Attributable to September		40%	34%	50%	40%	35%	50%	Average % derived from individual DRA % splits	
Gross Cost Sept		249	89	82	264	116	8	Calculation of division of cost between Sept and Feb events	
AMI Cost Sep		-51	-19	-24	-53	-29			
Gross Cost Covered by EQC		198	71	57	211	87			
Gross Cost Feb		374	172	80	397	215	8		
AMI Cost Feb		-76	-36	-24	-79	-54			
Gross Cost Covered BY EQC		298	136	56	317	161			
EQC Contribution Sept		91	55	59	90	55		EQC contributions estimated by applying % of maximum	
% \$100k Cap		91%	55%	59%	90%	55%		available cap (and of course cannot be greater than the gross	
EQC Contribution Feb		83	79	55	82	81		liability allocated to each event!). Note that figures for	
EQC Feb Contr % Gr Feb EQC DRA		28%	58%	97%	26%	50%		completed DRAs are estimates based on Arrow % split.	
								These are yet to be agreed with EQC	
<b>Summary</b>									
Gross Cost Covered By EQC		496	206	114	529	248			
EQC Contribution Sept		-91	-55	-59	-90	-55			
EQC Contribution Feb		-83	-79	-55	-82	-81			
Net Cost (EQC Cover)		322	72	0	356	112	0		
AMI Added Costs		126	55	15	132	83	15	AMI net cost for OOS claims effectively becomes OOS cost +	
Net Liability to AMI		449	128	15	488	195	15	DRA prep cost	

The example shown above is for the Christchurch Hills geographic zone where Over Cap claims arise from both the September and February events. This process is undertaken for each of the 56 segments (geographic zones times claim types). The aggregation of these results across the 56 segments is then used to derive for each event an overall average gross Over Cap claim size, an average EQC contribution on these Over Cap claims and an average claim size for claims which have converted to OOS claims. These results are then used as input assumptions in our overall liability calculation module. Table 2.1 sets out a summary of the DRA completion rates by valuation group for Over Cap claims.

Table 2.1 – DRA Completion Statistics for Over Cap Claims

Over Cap Claims: DRA Statistics		Ov Cap / Ov Cap	Ov Cap / OOS	Ov Cap / No Clm	OOS / Ov Cap	No Clm / Ov Cap	All Over Cap
<b>Total Number of Properties with Claims</b>							
Christchurch	Hills	58	4	39	160	633	894
Christchurch	Red	413	60	293	236	261	1,263
Christchurch	Yellow	163	36	243	191	371	1,004
Christchurch	Green	165	66	284	308	889	1,712
Christchurch	White	24	6	50	37	208	325
Waimak	Red / Yellow	52	16	317	6	4	395
Other Regions		7	11	76	2	21	117
<b>All Regions</b>		<b>882</b>	<b>199</b>	<b>1,302</b>	<b>940</b>	<b>2,387</b>	<b>5,710</b>
<b>No of Properties with completed DRA's<sup>1</sup></b>							
Christchurch	Hills	34	2	19	12	43	110
Christchurch	Red	300	36	238	21	21	616
Christchurch	Yellow	102	11	179	15	17	324
Christchurch	Green	72	17	100	20	26	235
Christchurch	White	11	1	26	8	14	60
Waimak	Red / Yellow	47	10	244	1	0	302
Other Regions		3	3	43	0	1	50
<b>All Regions</b>		<b>569</b>	<b>80</b>	<b>849</b>	<b>77</b>	<b>122</b>	<b>1,697</b>
<b>% With Completed DRA's</b>							
Christchurch	Hills	59%	50%	49%	8%	7%	12%
Christchurch	Red	73%	60%	81%	9%	8%	49%
Christchurch	Yellow	63%	31%	74%	8%	5%	32%
Christchurch	Green	44%	26%	35%	6%	3%	14%
Christchurch	White	46%	17%	52%	22%	7%	18%
Waimak	Red / Yellow	90%	63%	77%	17%	0%	76%
Other Regions		43%	27%	57%	0%	5%	43%
<b>All Regions</b>		<b>65%</b>	<b>40%</b>	<b>65%</b>	<b>8%</b>	<b>5%</b>	<b>30%</b>

<sup>1</sup>There are a further 3 DRA's for claims in OOS / No Claim Group

These figures show that there is a high penetration of completed DRA's for the claim groups with Over Cap claims from the September 2010 event (40% to 65%) but a much lower percentage for properties whose first Over Cap claim arose from the February 2011 event (5% to 8%).

### House Physical Damage – 13 June 2011 Event

Our approach to the 13 June event has been quite broad-brushed in approach, on account of:

- the experience is still very immature and the majority of claims will almost certainly be for additional damage to houses damaged in previous events; hence we expect that many of the claims will be for incremental amounts of damage
- the estimated cost, while above AMI's reinsurance retention for this event (approx. \$12m-\$13m), will be a long way below the amount of reinsurance cover available (\$1,000m); hence, any misstatement of the estimated liability will be offset by a movement in the reinsurance recoverable.

Consistent with this, we have projected ultimate claim numbers and mix using a Chain Ladder Approach. For average claim size we have simply adopted a similar average claim size as used for the other two major events.

### House physical damage – minor events

For minor events we have subjectively chosen IBNR claim numbers and average claim sizes based on the experience reported to date.

## 2.6 Translating to our Recommended Provision

Following are some general comments on the approach adopted for the set of assumptions needed to translate current value costs into our recommended provisions. A fuller explanation of the basis underlying the assumptions adopted is set out in Section 5 of this report.

### Claims Handling Expenses

Our loading for future claims handling expenses is derived directly from AMI's budget projections of the cost of the CeMAT operation, together with some additional Arrow International project management costs which were not included in the individual DRA data used in our analysis.

### Payment pattern

At this point in time, AMI has only paid a very small proportion of its ultimate liability. We have arbitrarily selected a payment pattern which allows for around 70%-75% of AMI's gross liability to be paid over the course of the next 2 years, with the remainder to spread out until FY2017. This pattern assumes that the Government's land remediation package, together with the desire of many claimants not to "wait their turn in the queue", will lead to a fairly material number of cash settlements occurring – and, of course, a good proportion of those that are repairs and those who choose to rebuild will be commenced within the next 12-24 months.

In any case, the gap between our assumed inflation rates and discount rates is such that changing the adopted payment pattern does not have a particularly noticeable effect on the discounted value of liabilities.

### Future Claims Inflation

We have selected a range of inflation rates for the different types of cover. The major exposure to adverse future inflation is, of course, for building repair and rebuild costs, where there is a material risk of demand surge creating a one-off rapid escalation in costs. Our selected rates for building cost inflation are based on some advice and estimates provided to us by New Zealand Treasury.

## Discount Rate

We have adopted the risk free zero coupon discount rates as published by New Zealand Treasury

## Risk Margins

It is not feasible to derive a risk margin for these events from any form of stochastic modelling exercise. As a result, our approach has been to derive a suitable risk margin by reference to:

- the risk margins adopted for claims liabilities for a range of other insurance classes
- the results of some sensitivity tests on our overall valuation result – which were used to test the range of adverse experience which might be needed to extinguish the risk margin adopted.

We understand that RBNZ has indicated to AMI that it should prepare its EQ provisions on the basis of a 75% probability of sufficiency. The risk margin we have adopted is intended to be consistent with this.

Our risk margins have been calculated as a percentage of the gross discounted central estimate but, where there is still room for reinsurance recoveries (i.e. where the inflated gross estimate is below the limit of the reinsurance cover), the risk margin is reduced by the present value of the remaining available reinsurance cover.

## 2.7 Valuation at 7 April 2011

In arriving at our recommended provision at 7 April 2011, we have not attempted to “go back in time” and separately select parameters based on information available at that date. Instead, our approach has been simply to:

- Remove any events which happened subsequent to 7 April 2011
- Add back any payments made in the period from 8 April 2011 to 30 June 2011
- Adjust the discount rates to reflect the risk free yield curve in place on 7 April 2011.

We understand that NZ Treasury is comfortable with this approach.

## 2.8 Information Supplied

Appendix A contains a detailed description of the data supplied for this valuation and summaries of reconciliations performed.

Our analysis and valuation of AMI's EQ liabilities has been largely based on the following key sources of data:

- Details of individual claims recorded by AMI, as reported in their ERT management reports
- Details of individual detailed repair/rebuild assessments (DRAs) prepared by Arrow International
- Details of individual claims recorded by EQC on houses insured by AMI.

To facilitate our assessment, the above data, together with some other miscellaneous pieces of data (e.g. Land Remediation Zones) was amalgamated into a property level database.

We were given advice from New Zealand Treasury setting out their views on relevant economic forecasts. These were used to form our views about future rates of claim cost inflation and discount rates. We also had the benefit of numerous discussions with various AMI executives, particularly those involved in the management of CeMAT.

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### 3 Claim Numbers

#### 3.1 Major Events – House Physical Damage

Our projection of the ultimate number of claims has been based on two pieces of analysis and modelling:

- From the reported experience of each event we have applied Chain Ladder projections to arrive at an estimate of the ultimate number of claims expected for each event.
- We have separately used the patterns emerging from completed DRA's to project the likely mix between Over Cap and OOS claims.

The results of the Chain Ladder process are detailed in Appendix B. Note that the experience for the 13 June 2011 event is very immature and, as such, the projection for this event should be seen as broad-brushed in nature.

As described in Section 2, the DRA assessment process provides not only an estimate of the overall cost but a classification into whether the property is a rebuild or repair and, in addition, an allocation of the damage between the September 2010 and February 2011 events. This allows us to attribute a net AMI liability (i.e. after deduction of EQC contribution) to each event and to determine whether or not the current Over Cap classification is appropriate. Table 3.1 sets out the outcome of the DRA analysis, noting that the counts shown here relate to properties, not claim counts. The actual volume of claims reported (shown in Table 3.2) is greater because there are numerous properties with claims reported for both events

**Table 3.1 - Projection of Mix Between Over Cap and Out of Scope**

Properties with Claims From Sept 10 and Feb 11 Events	C'church Hills	C'church Red	C'church Yellow	C'church Green	C'church White	Waimak. Red & Yellow	Other Regions	All Regions
<b>No of properties</b>								
With AMI Claims	2,020	1,515	1,869	12,433	1,028	522	1,911	21,298
With EQC Claims Only	1,580	79	389	17,824	1,067	51	8,399	29,389
	3,600	1,594	2,258	30,257	2,095	573	10,310	50,687
<b>Current Mix By Claim Type</b>								
Over Cap Sept Only	43	353	279	350	56	333	87	1,501
Over Cap Feb Only	793	497	562	1,197	245	10	23	3,327
Over Cap Both	58	413	163	165	24	52	7	882
	894	1,263	1,004	1,712	325	395	117	5,710
Out of Scope Only	1,126	252	865	10,721	703	127	1,794	15,588
	2,020	1,515	1,869	12,433	1,028	522	1,911	21,298
<b>Projected Mix By Claim Type</b>								
Over Cap Sept Only	38	314	258	255	51	304	67	1,287
Over Cap Feb Only	753	447	534	1,077	233	8	17	3,069
Over Cap Both	48	346	150	133	22	48	6	753
Over Cap	839	1,107	942	1,465	306	360	90	5,109
Out of Scope Only	1,181	408	927	10,968	722	162	1,821	16,189
	2,020	1,515	1,869	12,433	1,028	522	1,911	21,298
<b>Net Mov't - Over Cap to OOS</b>	<b>-55</b>	<b>-156</b>	<b>-62</b>	<b>-247</b>	<b>-19</b>	<b>-35</b>	<b>-27</b>	<b>-601</b>

These figures show that applying the patterns observed in DRA's completed to date to those properties without DRA's projects about 600 properties will ultimately transfer from an Over Cap claim group to OOS only. In other words, of the 5,710 properties currently in the Over Cap claim groups, we expect that approximately 5,100 will end up involving an over cap element. The translation from properties to claim volumes for each of the September 2010 and February 2011 events is shown in Table 3.2. These results reflect both the movements between Over Cap and OOS as well our estimates of future IBNR activity for these events.

**Table 3.2 – Claim Volumes for September and February Events**

04 September 2010	C'church Hills	C'church Red	C'church Yellow	C'church Green	C'church White	Waimak. Red & Yellow	Other Regions	All Regions
<b>Over Cap</b>								
In database now	101	766	442	515	80	385	94	2,383
Move to OOS	-15	-106	-34	-127	-7	-33	-21	-343
IBNR	1	6	4	4	1	3	1	20
Estimated Ultimate	87	666	412	392	74	355	74	2,060
% Moving to OOS	15%	14%	8%	25%	9%	9%	22%	14%
<b>Out of Scope</b>								
In database now	570	362	504	5,692	332	112	1,230	8,802
Move from Over Cap	15	106	34	127	7	33	21	343
IBNR	19	15	17	188	11	5	40	295
Estimated Ultimate	604	483	555	6,007	350	150	1,291	9,440
<b>Overall Total</b>	<b>691</b>	<b>1,149</b>	<b>967</b>	<b>6,399</b>	<b>424</b>	<b>505</b>	<b>1,365</b>	<b>11,500</b>

22 February 2011	C'church Hills	C'church Red	C'church Yellow	C'church Green	C'church White	Waimak. Red & Yellow	Other Regions	All Regions
<b>Over Cap</b>								
In database now	851	910	725	1,362	269	62	30	4,209
Move to OOS	-50	-117	-41	-152	-14	-6	-7	-387
IBNR	16	16	14	25	5	1	1	78
Estimated Ultimate	817	809	698	1,235	260	57	24	3,900
% Moving to OOS	6%	13%	6%	11%	5%	10%	23%	9%
<b>Out of Scope</b>								
In database now	887	242	723	6,548	489	52	658	9,599
Move from Over Cap	50	117	41	152	14	6	7	387
IBNR	95	36	78	680	51	6	68	1,014
Estimated Ultimate	1,032	395	842	7,380	554	64	733	11,000
<b>Overall Total</b>	<b>1,849</b>	<b>1,204</b>	<b>1,540</b>	<b>8,615</b>	<b>814</b>	<b>121</b>	<b>757</b>	<b>14,900</b>

The EQC has completed a large proportion of its assessments on claims from the September 2010 event. As a check on the results of our DRA modelling, we have examined the EQC's view as to how many of AMI's Over Cap claims from this event EQC has classified as Over Cap (see Table 3.3).

Table 3.3 – EQC Classification of September Over Cap Claims

EQC Status: Sept 2010 Over Cap Properties	C'church Hills	C'church Red	C'church Yellow	C'church Green	C'church White	Waimak. Red & Yellow	Other Regions	All Regions
<b>Fieldwork Completed</b>								
Over Cap	48	619	308	228	43	355	59	1,660
Under Cap	24	92	70	150	14	25	21	396
	72	711	378	378	57	380	80	2,056
% Over Cap	67%	87%	81%	60%	75%	93%	74%	81%
<b>Fieldwork in progress</b>	29	55	64	137	23	5	14	327
<b>Total No of Properties</b>	101	766	442	515	80	385	94	2,383

This shows that EQC has currently completed assessments on about 86% of AMI's claims and that 1,660 out of the 2,056 completed have been classified as Over Cap, with around 300 still to be done. By comparison, our DRA projection is indicating an ultimate total of just over 2,000 Over Cap claims for the September 2010 event.

This implies that virtually all of the remaining assessments to be done by EQC would need to be classified as Over Cap for alignment between the two. This suggests that the DRA-based projection may be overstating the likely ultimate position, or that the EQC is understating the ultimate position. Differences in classification between AMI and EQC are, in all likelihood, going to mainly revolve around properties whose damage is in the vicinity of the EQC cap. As such, AMI's ultimate EQ liability is unlikely to be materially affected by exactly into which group these properties fall,

In our valuation we have decided to adopt the mix implied by our DRA-based projection, which, if anything, may mean that our estimate contains a small margin.

### 13 June Event

Our initial projection of claim volumes for the 13 June event indicates an ultimate volume of about 2,200 claims, comprising about 300 Over Cap claims, 1,360 OOS claims and 500 claims for other cover types.

The location and nature of this event suggests that there will, in all likelihood, be a large degree of overlap with properties damaged in previous events. In this regard it is worth noting that of the claims reported to 3 August 2011, only 54 claims are for properties which have not had previous overlap earthquake claims recorded with AMI.

## 3.2 Major Events - Other Covers

Projected claim numbers for other covers for the three major events is set out in Table 3.4 below, with details set out in Appendix B

For most of these covers, the lodgement experience has matured with relatively small volumes of IBNR claims. The key exception is Temporary Accommodation where the claims reported to date largely relate to properties where the damage incurred has made

them unliveable. Our valuation allows for a surge in claims to occur once the rebuild and repair process gets fully under way.

The volume of IBNR claims for Temporary Accommodation has been based on an expectation that AMI will ultimately receive Temporary Accommodation claims equivalent to around 100% of the properties for which it has currently received Over Cap House claims. A similar comment applies to Loss of Rent claims, although the volumes involved are materially lower.

**Table 3.4 – Major Events: Claim Numbers for Other Covers**

Major Events - Other Covers		Number of Claims		
		Reported to Date	Estimated IBNR	Ultimate Number
<b>4 Sept 2010 Darfield</b>	<b>Lost Rent</b>	156	84	240
	<b>Temp Accom</b>	915	1,485	2,400
	<b>Contents</b>	581	19	600
	<b>Vehicles</b>	1,111	19	1,130
	<b>Other</b>	67	3	70
	<b>Total</b>	2,830	1,610	4,440
<b>22 Feb 2011 Lyttleton</b>	<b>Lost Rent</b>	539	46	585
	<b>Temp Accom</b>	1,983	1,317	3,300
	<b>Contents</b>	1,361	239	1,600
	<b>Vehicles</b>	1,938	162	2,100
	<b>Other</b>	26	9	35
	<b>Total</b>	5,847	1,773	7,620
<b>13 June 2011 Lyttleton</b>	<b>Lost Rent</b>	37	13	50
	<b>Temp Accom</b>	113	87	200
	<b>Contents</b>	39	21	60
	<b>Vehicles</b>	119	61	180
	<b>Other</b>	5	7	12
	<b>Total</b>	313	189	502
<b>All Events</b>	<b>Overall Total</b>	8,990	3,572	12,562

### 3.3 Minor Events

Table 3.5 below sets out the claim numbers we have adopted for the 6 minor events. The allowance for IBNR claims has been made on a subjective basis by reference to how long ago the event happened and the patterns exhibited for the major events.

The three events listed on the left all occurred in the period between the September 2010 and February 2011 events, with the ones listed on the right all occurring in the period following the February 2011 event.



**Table 3.5 – Claim Numbers for Minor Events**

Event	Cover	Reported to 18 July	Adopted IBNR	Ultimate Number	Event	Cover	Reported to 18 July	Adopted IBNR	Ultimate Number
EQ Cat 97 19 Oct 2010	Over EQC Cap	6	0	6	EQ Cat 107 16 Apr 2011	Over EQC Cap	11	0	11
	Out of Scope	92	0	92		Out of Scope	30	0	30
		98	0	98			41	0	41
	Lost Rent	0	0	0		Lost Rent	1	0	1
	Temp Accom	2	0	2		Temp Accom	1	0	1
	Contents	4	0	4		Contents	1	0	1
	Vehicles	2	1	3		Vehicles	7	0	7
Other	2	0	2	Other	0	0	0		
		10	1	11			10	0	10
<b>Total</b>		<b>108</b>	<b>1</b>	<b>109</b>	<b>Total</b>		<b>51</b>	<b>0</b>	<b>51</b>
EQ Cat 99 26 Dec 2010	Over EQC Cap	10	0	10	EQ Cat 111 06 Jun 2011	Over EQC Cap	0	0	0
	Out of Scope	773	7	780		Out of Scope	38	2	40
		783	7	790			38	2	40
	Lost Rent	5	0	5		Lost Rent	0	0	0
	Temp Accom	4	0	4		Temp Accom	1	0	1
	Contents	5	0	5		Contents	0	0	0
	Vehicles	19	0	19		Vehicles	2	0	2
Other	3	0	3	Other	0	0	0		
		36	0	36			3	0	3
<b>Total</b>		<b>819</b>	<b>7</b>	<b>826</b>	<b>Total</b>		<b>41</b>	<b>2</b>	<b>43</b>
EQ Cat 103 20 Jan 2011	Over EQC Cap	1	0	1	EQ Cat 114 21 Jun 2011	Over EQC Cap	1	4	5
	Out of Scope	48	2	50		Out of Scope	16	9	25
		49	2	51			17	13	30
	Lost Rent	0	0	0		Lost Rent	2	0	2
	Temp Accom	0	0	0		Temp Accom	0	0	0
	Contents	2	0	2		Contents	0	0	0
	Vehicles	1	0	1		Vehicles	3	0	3
Other	0	0	0	Other	0	0	0		
		3	0	3			5	0	5
<b>Total</b>		<b>52</b>	<b>2</b>	<b>54</b>	<b>Total</b>		<b>22</b>	<b>13</b>	<b>35</b>

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## 4 Average Claim Size

### 4.1 House Physical Damage - Approach Adopted

As described in Section 2, the average claim sizes which we have adopted in calculating AMI's EQ liabilities have been based on the aggregation of a projection of 56 individual segments of properties on which claims have been reported to AMI. Because many properties have incurred damage from more than one event, we have adopted an approach which is founded around the overall cost of damage at a property level and then deals with how this is allocated among the contributing events.

The assumptions we have selected are largely driven from the trends and patterns present in the completed DRA's. We have deemed the cost estimates emanating from the DRAs (and also in AMI's case estimates) to represent the value at which claims could currently be settled for and hence are a reasonable representation of values as at 30 June 2011.

For each segment, assumptions are made about:

- The respective proportions of Rebuild, Repair and Under Cap; for this latter group, AMI's liability is assumed to revert to OOS damage only
- The overall average gross cost (excluding GST) of each of Rebuilds, Repairs and OOS, noting that for Rebuilds and Repairs, the average sum insured is used to scale the projected average size for any differences in the underlying value of damaged properties between completed and uncompleted DRAs
- The split of the average gross cost between those elements covered by EQC and those which are outside the scope of EQC cover, noting that:
  - ▶ this split has been based on advice from CeMAT management in early June 2011, on the basis of their understanding at the time, of how negotiations with EQC were likely to play out
  - ▶ very recent discussions with EQC have suggested that some of the costs currently excluded when calculating the EQC-covered part of the overall DRA cost may in fact end up being included when calculating EQC contributions
  - ▶ we have not yet attempted to reflect the impact of this in our modelling but we expect that this change will have a marginally beneficial impact on AMI's net position
- The allocation of the overall damage between the September 2010 and February 2011 events, noting that, on practical grounds,:
  - ▶ this allocation is assumed to apply uniformly to all elements comprising the overall cost

- ▶ we have made one specific adjustment to the “raw” percentage splits recorded in the completed DRAs – where the property is classified as a Rebuild and the percentage attributed to September 2010 is 80% or more, we have adjusted the mix to be 100% allocated to September 2010
- ▶ Our projections assume that the percentage splits assessed by Arrow will, on average, reflect the position negotiated and ultimately agreed with EQC
- the likely EQC contribution from each event, where we have essentially assumed that the vast majority of properties with damage from both events will have access to two lots of EQC cover
- ▶ in this regard we note that AMI’s treatment of policies paying by monthly instalment as monthly policies means that something like 80% of AMI’s policies will have renewed between these two events (with policy renewal being one of the key triggers for reinstatement of EQC cover).

For properties where AMI has recorded OOS claims only, we have largely relied on the case estimates recorded in AMIGO as the basis for selecting claim sizes for these claims.

### Adopted Assumptions and Projection Results

Appendix D sets out for each of the valuation groups containing Over Cap claims full details of the assumptions adopted, together with a statistics for the completed DRAs. Appendix E re-presents this information, together further statistical information, in the form of two-way tables across the valuation groups showing both actual DRA experience and the outworkings of the assumptions adopted for those awaiting DRA’s.

## 4.2 Experience for Over Cap Properties

Following are some high level summaries to draw out the main features emerging from our projection of those claims currently classified by AMI as Over Cap.

### Gross DRA Costs & Mix by Repair Type

Table 4.1 shows the percentage breakdown and average gross DRA cost per damaged property. The information shown for those where the DRA has been completed is essentially just a summary of what is contained in the DRAs, whereas the information shown for those where the DRA is yet to be done is a summary of our assumptions.

Table 4.1 – Gross DRA Cost Experience

Gross DRA Sizes	% Breakdown of Claims			Average Cost Per Damaged Property \$000				
	Rebuild	Repair	Under Cap	Rebuild	Repair	Reb+ Rep	Under Cap	Total
<b>Completed DRAs</b>								
Hills	60%	30%	10%	611	245	489	24	443
Red	78%	9%	13%	333	244	324	22	284
Yellow	73%	20%	7%	404	248	370	29	345
Green	46%	31%	23%	430	251	357	15	279
White	70%	22%	8%	504	264	447	22	412
Waimak	86%	6%	8%	317	200	310	22	286
Other	60%	17%	23%	330	248	312	22	245
	72%	16%	13%	372	245	350	21	309
<b>Yet to be Done</b>								
Hills	64%	30%	6%	549	204	439	26	416
Red	81%	8%	12%	338	207	327	24	292
Yellow	83%	12%	6%	365	226	347	30	329
Green	60%	27%	13%	357	198	308	17	269
White	67%	28%	5%	504	231	423	24	402
Waimak	84%	5%	11%	290	160	282	24	254
Other	60%	15%	25%	346	172	312	24	238
	69%	21%	10%	397	205	352	23	320
<b>Total</b>								
Hills	64%	30%	6%	556	209	445	25	419
Red	79%	8%	12%	335	226	325	23	288
Yellow	79%	15%	6%	376	236	354	30	334
Green	58%	28%	14%	365	206	314	16	271
White	67%	27%	6%	504	236	428	23	404
Waimak	86%	6%	9%	311	191	303	22	278
Other	60%	16%	24%	339	208	312	23	241
	70%	20%	11%	390	215	351	22	316

Some observations from these results:

- for completed DRA's
  - ▶ 72% have been assessed as Rebuilds, 16% as Repairs
  - ▶ for the remaining 13%, the size of the rebuild/repair and the split between events results in the cost attributed to each event falling below the EQC cap of \$100k and hence the EQC becomes responsible for rebuild/repair costs involved; for these claims AMI remains liable for the damage which is outside the scope of EQC's cover
- for the DRA's which are yet to be done, the projection allows for a small shift from rebuild to repair (from 72%/16% to 69%/21%) and a lower proportion of Under Cap claims (from 13% to 10%); this reflects a number of contributing factors:
  - ▶ better recording practices by AMI resulting in more accurate allocation initially between Over Cap and OOS
  - ▶ the emergence of claims from areas only mildly affected by September 2010 (mainly the Hills region of Christchurch), and hence a larger proportion with only one EQC cap applying
  - ▶ while the February 2011 event was more severe in nature, the "new" damage occurred in areas with higher valued buildings, producing a lower percentage of rebuilds



- interestingly, when the Rebuild/Repair experience is combined, the projected gross DRA cost is almost identical between completed and uncompleted DRA's (\$350k for completed versus \$352k for uncompleted).
- For those categorised as moving to Under Cap, the average cost of Out of Scope damage as estimated in the DRA process is \$21k, with a projected cost of \$23k for those yet to be completed. Note that, because these claims, more than likely, relate to properties which have sustained more damage than those for which AMI has only received OOS claims, we expect that the OOS claim size shown in this table will be higher than the average claim size for "pure" OOS claims; our valuation of the liability for OOS claims recognises this.

### Allocation between September 2010 and February 2011 Events

Table 4.2 shows the overall allocation of gross costs between the two events. Note that the five claim types shown in the table refer to whether there was an Over Cap, OOS or No Claim for the September event followed by an Over Cap, OOS or No Claim for the February event.

**Table 4.2 – Attribution of Gross Cost to September 2011 Event**

% of Cost Attributed to Sept 2010	Ov Cap / Ov Cap	Ov Cap / OOS	Ov Cap / No Clm	OOS / Ov Cap	No Clm / Ov Cap	All Over Cap
<b>Properties With Completed DRAs</b>						
Christchurch Hills	39%	24%	81%	12%	9%	29%
Christchurch Red	64%	74%	82%	29%	20%	69%
Christchurch Yellow	76%	74%	94%	41%	26%	81%
Christchurch Green	62%	81%	86%	44%	16%	65%
Christchurch White	58%	50%	91%	12%	16%	53%
Waimak Red / Yellow	91%	99%	97%	50%	0%	96%
Other Regions	88%	85%	96%	0%	100%	95%
<b>All Regions</b>	<b>66%</b>	<b>76%</b>	<b>90%</b>	<b>29%</b>	<b>15%</b>	<b>72%</b>
<b>Assumed Future Experience</b>						
Christchurch Hills	39%	74%	83%	9%	5%	9%
Christchurch Red	65%	74%	82%	20%	10%	29%
Christchurch Yellow	75%	80%	94%	29%	19%	35%
Christchurch Green	63%	79%	87%	28%	14%	31%
Christchurch White	70%	80%	90%	10%	10%	21%
Waimak Red / Yellow	95%	95%	95%	10%	10%	86%
Other Regions	94%	95%	95%	10%	10%	67%
<b>All Regions</b>	<b>64%</b>	<b>80%</b>	<b>89%</b>	<b>21%</b>	<b>11%</b>	<b>26%</b>
<b>Overall</b>						
Christchurch Hills	39%	47%	82%	9%	5%	11%
Christchurch Red	64%	74%	82%	21%	11%	48%
Christchurch Yellow	75%	78%	94%	30%	19%	51%
Christchurch Green	62%	80%	87%	29%	14%	35%
Christchurch White	66%	80%	91%	10%	10%	27%
Waimak Red / Yellow	91%	97%	96%	11%	10%	94%
Other Regions	91%	92%	96%	10%	14%	79%
<b>All Regions</b>	<b>66%</b>	<b>79%</b>	<b>90%</b>	<b>22%</b>	<b>11%</b>	<b>40%</b>

Overall, for the DRA's completed to date, 72% of the gross DRA cost has been allocated to the September 2010 event whereas for uncompleted DRA's the allocation is only 26%. This largely reflects the fact that the completed DRA's are mostly concentrated on Over Cap claims from the September event. Combining the completed and uncompleted experience indicates that about 40% of the overall gross Over Cap cost is attributable to the September 2010 event and 60% to the February 2011 event. Some further points to note from the above figures are as follows:

- The percentage allocation to September follows a logical sequence, with the Over Cap / No Claim group having the highest proportion allocated to September (90% for completed DRA's) and with the percentages for other groups reducing as the profile moves more towards the main damage occurring in the February event
- For the groups with Over Cap claims from September 2010, the September percentage adopted for uncompleted DRA's is generally quite similar to that exhibited by the DRA's completed to date; this reflects the relatively high penetration (overall about 60%) of completed DRA's for the September event
- For the two groups where the Over Cap claim has emerged from February 2011, we have assumed that the experience for the uncompleted DRA's will be more biased to February than that exhibited by the DRA's completed to date; this is line with our understanding of how AMI's prioritisation of DRA's has progressed, and noting that EQC's own Over Cap/Under Cap determination has to date been an important trigger in this process (which at this stage are much further progressed for houses first damaged in September 2010).

### EQC Contributions

Table 4.3 sets out the actual and projected average EQC contribution per Over Cap property. These averages relate only to those claims which are deemed to be Rebuilds or Repairs (i.e. they exclude those properties we have re-classified as Under Cap).

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Table 4.3 – Average EQC Contribution Per Over Cap Property

Average EQC Contribution Per Property \$000		Ov Cap / Ov Cap	Ov Cap / OOS	Ov Cap / No Clm	OOS / Ov Cap	No Clm / Ov Cap	All Over Cap
<b>Properties With Completed DRAs</b>							
Christchurch	Hills	160	177	127	138	114	133
Christchurch	Red	152	141	129	140	121	141
Christchurch	Yellow	143	130	111	133	118	123
Christchurch	Green	144	121	116	143	121	129
Christchurch	White	142		114	120	131	124
Waimak	Red / Yellow	112	100	104			105
Other Regions		115	125	106		100	108
<b>All Regions</b>		<b>146</b>	<b>130</b>	<b>115</b>	<b>137</b>	<b>119</b>	<b>127</b>
<b>Assumed Future Experience</b>							
Christchurch	Hills	156	159	116	133	115	120
Christchurch	Red	158	136	125	137	112	129
Christchurch	Yellow	142	131	110	139	113	123
Christchurch	Green	145	119	116	141	121	126
Christchurch	White	149	121	114	123	127	126
Waimak	Red / Yellow	92	99	109	94	74	105
Other Regions		110	106	106	40	126	111
<b>All Regions</b>		<b>149</b>	<b>123</b>	<b>114</b>	<b>137</b>	<b>118</b>	<b>124</b>
<b>Overall</b>							
Christchurch	Hills	158	169	122	133	115	121
Christchurch	Red	154	139	128	137	113	135
Christchurch	Yellow	143	130	111	139	113	123
Christchurch	Green	144	119	116	141	121	126
Christchurch	White	145	121	114	123	127	126
Waimak	Red / Yellow	110	100	105	94	74	105
Other Regions		113	112	106	40	125	109
<b>All Regions</b>		<b>147</b>	<b>126</b>	<b>115</b>	<b>137</b>	<b>118</b>	<b>125</b>

Overall, the valuation allows for an EQC contribution of \$125k per Over Cap property. These results show that the assumed level of EQC contribution for properties awaiting DRA's is quite similar to that calculated for completed DRA's. Also note that the progression of the average EQC contribution follows a logical sequence, with the properties with only a single Over Cap claim (i.e. no claim for the other event) having the lowest expected contribution and those with Over Cap claims on both events having the highest expected contribution. The average EQC contribution is more than the \$100k EQC cap due to our assumption that many claims will have access to multiple EQC contributions.

### Net Liability Per Over Cap Property

Earlier in this Section, we showed that the average gross combined Rebuild/Repair cost is projected to be around \$350k per Over Cap property. When an average EQC contribution of \$125k is allowed for, this means our valuation effectively allows for a net liability per Over Cap property of \$225k (noting that this excludes those properties currently classified as Over Cap but which we expect will ultimately become Under Cap).

### 4.3 Average Claim Size - Out of Scope Claims

#### Basis of Adopted Assumptions

In the way we have undertaken this valuation, AMI’s liability for Out of Scope damage arises from three sources:

- The out of scope component of the damage on properties where the EQC-covered damage has exceeded the EQC cap and hence there is an Over Cap liability for AMI; for these claims the cost of the out of scope component is incorporated in DRA cost estimates and hence is included in the average Rebuild/Repair costs we have adopted for Over Cap claims
- The out of scope damage on those AMI properties currently classified as Over Cap but which the DRA process deems them to be Under Cap; for these properties our average claim size is based on the out of scope component of the DRA (with an amount of about \$1,500 added to cover the cost of DRA preparation) and the cost is allocated between events in line with that indicated by the DRA allocations
- For the “pure” OOS claims, our adopted average claim sizes and allocations to events have been largely driven by AMI’s case estimates but do take into account the feedback mentioned earlier (see section 2.4).

#### OOS Claim Size - Experience Vs Adopted

Table 4.4 sets out the available OOS size experience. The arrows indicate the “equivalent” Over Cap claim group. For the Over Cap claims, the average comes directly from the DRA. For OOS claims it comes from case estimates in AMIGO. We understand that virtually all September 2010 OOS claims (i.e. the OOS/No Claim and the first part of the OOS/OOS groups) now contain a real estimate whereas the February 2011 OOS claims (i.e. the second part of OOS/OOS and No Claim/OOS) largely still contain the default estimate of \$17,391 (or \$20,000 inclusive of GST).

**Table 4.4 – Out of Scope Claim Size Experience**

Average Out of Scope Size per Property \$'000	Ov Cap / Ov Cap	Ov Cap / OOS	Ov Cap / No Clm	OOS / Ov Cap	No Clm / Ov Cap	OOS / No Clm	OOS / OOS	No Clm / OOS	All Claims
<b>From Completed DRAs</b>									
Rebuilds	31	27	29	29	25				29
Repairs	24	30	25	32	25				26
Under cap	24	16	17	15	17				19
	29	26	27	28	24				27
<b>AMIGO Case Estimates</b>						10	26	17	15
<b>Adopted in Valuation</b>						10	17	17	14

Looking at the average claim sizes for the Over Cap/No Claim and OOS/No Claim groups (i.e. the groups with the best views of likely cost) we can see a progression towards a lower size as the apparent severity of damage to a property’s main buildings

decreases – from \$29k on rebuilds to \$17k on Under caps and to \$10k on OOS claims. For this valuation, we have adopted the size implied by AMI's case estimates. This cost is 100% allocated to the September event.

As noted in Section 2, feedback from the manager of the OOS claims area, albeit anecdotal in nature, has indicated that a proportion of the OOS claims reported for February appear to be “double up” claims for the damage incurred in the September event and that where there is additional damage in February, it appears that generally more than 50% of the damage is attributable to the September event. Taking this feedback into account we have adopted an average claim size for OOS/OOS properties of \$17k, which maintains a similar relationship to the Under Cap claim size in the Over Cap/Over Cap claim group and produces a suitable relationship to the adopted size for the OOS/No Claim group. This cost is allocated 60% to September 2010 and 40% to February 2011.

For the No Claim/OOS group, there was a strong expectation immediately after the February 2011 event that OOS damage would be more severe than for September 2010 – hence the adoption of a default estimate of \$17.4k. In the absence of any definitive information, we have adopted this figure as our average OOS claim size for this group. It is worth noting however that the average OOS claim size on Under cap claims with DRA's is currently running at \$17k – which, on the patterns observed for September 2010, suggest that the ultimate size may turn out to be lower than our adopted figure. This cost is allocated 100% to the February event.

#### 4.4 Translation to Average Size Per Claim (Per Event)

In our main calculation module, we project the liabilities for each event separately. In this section we summarise the translation of the above costs per damaged property to average claim sizes and also show the total estimated cost (in 30 June 2011 values) for each of the September 2010 and February 2011 events. For completeness, we have also repeated the summary of claim numbers shown in section 3.

##### 4 September 2010 Event

Table 4.5 summarises the results of our projection of House physical damage costs for the 4 September event, showing claim numbers, the projected ultimate cost (in 30/6/11 values) and the average size of claims, broken down by valuation region and split between Over Cap and OOS. Note that the average EQC contribution (3<sup>rd</sup> last line of table) is a somewhat misleading statistic in that:

- the numerator represents the total of all EQC contributions to the September event (including those properties for which AMI has not recorded a September Over Cap claim but for which the DRA process has allocated part of the damage to the September event)
- the denominator is the count of properties for which there is currently an Over Cap claim (but net of those deemed by the DRA process to become OOS only).

Table 4.5 – 4 September 2010 – Summary House Physical Damage Costs

04 September 2010		C'church Hills	C'church Red	C'church Yellow	C'church Green	C'church White	Waimak. Red & Yellow	Other Regions	All Regions
<b>Numbers of Claims</b>									
<b>Over Cap</b>	In database now	101	766	442	515	80	385	94	2,383
	Move to OOS	-15	-106	-34	-127	-7	-33	-21	-343
	IBNR	1	6	4	4	1	3	1	20
	Estimated Ultimate	<b>87</b>	<b>666</b>	<b>412</b>	<b>392</b>	<b>74</b>	<b>355</b>	<b>74</b>	<b>2,060</b>
<b>OOS</b>	In database now	570	362	504	5,692	332	112	1,230	8,802
	Move from Over Cap	15	106	34	127	7	33	21	343
	IBNR	19	15	17	188	11	5	40	295
	Estimated Ultimate	<b>604</b>	<b>483</b>	<b>555</b>	<b>6,007</b>	<b>350</b>	<b>150</b>	<b>1,291</b>	<b>9,440</b>
<b>Overall Total</b>		<b>691</b>	<b>1,149</b>	<b>967</b>	<b>6,399</b>	<b>424</b>	<b>505</b>	<b>1,365</b>	<b>11,500</b>
<b>Total Cost (\$m in 30/06/11 Values)</b>									
<b>OVER CAP</b>									
<b>Reported</b>	Gross Liability	42	175	169	162	36	102	22	709
	EQC contribution	-21	-79	-61	-76	-15	-35	-8	-295
	Net liability	21	96	108	86	21	68	15	414
<b>IBNR</b>	Gross Liability	0	2	2	2	0	1	0	7
	EQC contribution	0	-1	-1	-1	0	0	0	-3
	Net liability	0	1	1	1	0	1	0	4
<b>Total</b>	Gross Liability	43	176	171	164	36	103	23	716
	EQC contribution	-22	-79	-62	-77	-15	-35	-8	-298
	Net liability	21	97	109	87	21	68	15	418
<b>OOS</b>									
	Reported to date	4	1	4	54	3	1	13	81
	T/fer from Over Cap	0	1	1	2	0	1	0	5
<b>IBNR</b>		4	3	4	56	3	2	14	86
		0	0	0	2	0	0	0	3
		<b>5</b>	<b>3</b>	<b>5</b>	<b>58</b>	<b>3</b>	<b>2</b>	<b>14</b>	<b>89</b>
<b>OVERALL</b>		<b>25</b>	<b>100</b>	<b>113</b>	<b>145</b>	<b>24</b>	<b>70</b>	<b>29</b>	<b>507</b>
<b>Average Claim Size \$000</b>									
<b>Over Cap</b>	Gross Liability	489	264	414	419	489	291	306	347
	EQC contribution	-248	-119	-150	-196	-203	-98	-106	-144
	Net liability	<b>241</b>	<b>145</b>	<b>264</b>	<b>222</b>	<b>285</b>	<b>192</b>	<b>201</b>	<b>203</b>
<b>OOS</b>		<b>7</b>	<b>6</b>	<b>8</b>	<b>10</b>	<b>9</b>	<b>14</b>	<b>11</b>	<b>9</b>

Overall, our projection estimates that the net cost of House physical damage, after EQC contributions but before reinsurance recoveries, in current values for the September 2010 event will be \$507m.

### 22 February 2011 Event

Table 4.6 summarises the results of our projection of House physical damage costs for the 22 February event, showing claim numbers, the projected ultimate cost (in 30/6/11 values) and the average size of claims, broken down by valuation region and split between Over Cap and OOS. The average EQC contribution suffers from a similar distortion to that mentioned above, but to a much lesser extent.

Table 4.6 – 22 February 2011 event – Summary of Physical Damage Costs

22 February 2011		C'church Hills	C'church Red	C'church Yellow	C'church Green	C'church White	Waimak. Red & Yellow	Other Regions	All Regions
<b>Numbers of Claims</b>									
<b>Over Cap</b>	In database now	851	910	725	1,362	269	62	30	4,209
	Move to OOS	-50	-117	-41	-152	-14	-6	-7	-387
	IBNR	16	16	14	25	5	1	1	78
	Estimated Ultimate	<b>817</b>	<b>809</b>	<b>698</b>	<b>1,235</b>	<b>260</b>	<b>57</b>	<b>24</b>	<b>3,900</b>
<b>OOS</b>	In database now	887	242	723	6,548	489	52	658	9,599
	Move from Over Cap	50	117	41	152	14	6	7	387
	IBNR	95	36	78	680	51	6	68	1,014
	Estimated Ultimate	<b>1,032</b>	<b>395</b>	<b>842</b>	<b>7,380</b>	<b>554</b>	<b>64</b>	<b>733</b>	<b>11,000</b>
<b>Overall Total</b>		<b>1,849</b>	<b>1,204</b>	<b>1,540</b>	<b>8,615</b>	<b>814</b>	<b>121</b>	<b>757</b>	<b>14,900</b>
<b>Total Cost (\$m in 30/06/11 Values)</b>									
<b>OVER CAP</b>									
<b>Reported</b>	Gross Liability	331	185	165	297	95	7	6	1,086
	EQC contribution	-81	-70	-54	-109	-23	-3	-2	-343
	Net liability	251	115	110	188	72	3	4	743
<b>IBNR</b>	Gross Liability	7	4	3	6	2	0	0	22
	EQC contribution	-2	-1	-1	-2	0	0	0	-7
	Net liability	5	2	2	4	1	0	0	15
<b>Total</b>	Gross Liability	338	189	168	303	97	7	6	1,108
	EQC contribution	-82	-72	-56	-111	-24	-3	-2	-350
	Net liability	<b>256</b>	<b>118</b>	<b>113</b>	<b>192</b>	<b>73</b>	<b>3</b>	<b>4</b>	<b>758</b>
<b>OOS</b>									
	Reported to date	13	3	10	99	7	1	10	143
	T/fer from Over Cap	1	2	1	2	0	0	0	7
<b>IBNR</b>		14	5	12	101	8	1	11	150
		1	0	1	10	1	0	1	15
		<b>15</b>	<b>5</b>	<b>13</b>	<b>111</b>	<b>8</b>	<b>1</b>	<b>12</b>	<b>165</b>
<b>OVERALL</b>		<b>271</b>	<b>123</b>	<b>125</b>	<b>303</b>	<b>81</b>	<b>4</b>	<b>15</b>	<b>923</b>
<b>Average Claim Size \$000</b>									
<b>Over Cap</b>	Gross Liability	414	234	241	245	373	122	247	284
	EQC contribution	-101	-89	-80	-90	-92	-61	-94	-90
	Net liability	<b>313</b>	<b>145</b>	<b>161</b>	<b>156</b>	<b>281</b>	<b>61</b>	<b>153</b>	<b>194</b>
<b>OOS</b>		<b>15</b>	<b>13</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>11</b>	<b>16</b>	<b>15</b>

Overall, our projection estimates that the net cost of House physical damage, after EQC contributions but before reinsurance recoveries, in current values for the February 2011 event will be \$923m.

### 13 June 2011 Event Average Claim Size

For the 13 June 2011 event, we have applied a broad-brushed approach to the selection of House physical damage average claim sizes:

- for Over cap claims we have adopted an average size of \$190k, marginally below the cost adopted for the February 2011 event
- for OOS claims, we have adopted an average size of \$15k, the same as adopted for the February 2011 event.

#### 4.5 Average Claim Size: Major Events - Other Covers

Table 4.7 sets out our adopted average claim sizes for Other Covers for each of the three major events. These have been projected based on the development patterns exhibited to date for these events. Appendix F shows the basis of the projections.

**Table 4.7 – Adopted Claim Size for Other Covers**

Major Events - Other Covers		Average Claim Size		
		Reported to Date	Future Development	Ultimate Size
4 Sept 2010 Darfield	Lost Rent	9,552	-352	9,200
	Temp Accom	14,607	-7	14,600
	Contents	7,363	1,637	9,000
	Vehicles	1,139	11	1,150
	Other	10,380	-690	9,690
	<b>Total</b>	<b>7,454</b>	<b>2,597</b>	<b>10,051</b>
22 Feb 2011 Lyttleton	Lost Rent	11,989	311	12,300
	Temp Accom	16,503	97	16,600
	Contents	16,871	-1,871	15,000
	Vehicles	2,467	33	2,500
	Other	9,521	193	9,714
	<b>Total</b>	<b>11,489</b>	<b>527</b>	<b>12,016</b>
13 June 2011 Lyttleton	Lost Rent	16,108	-608	15,500
	Temp Accom	16,770	-170	16,600
	Contents	11,897	103	12,000
	Vehicles	1,729	-129	1,600
	Other	1,699	4,551	6,250
	<b>Total</b>	<b>10,125</b>	<b>189</b>	<b>10,315</b>
<b>All Events</b>	<b>Overall Total</b>	<b>10,171</b>	<b>1,082</b>	<b>11,254</b>

#### 4.6 Average Claim Sizes – Minor Events

For the minor events, we have effectively adopted the average claim sizes implied by AMI's case estimates. Given the insignificant amount of liabilities involved with these events, we did not consider that any more detailed analysis was warranted.



## 5 Other Valuation Elements

### 5.1 Claims Handling Expenses

For this valuation, we have adopted a loading for claims handling expenses of 3% of gross claims payments. This loading has been derived directly from:

- AMI’s budget projections of the cost of the CeMAT operation of \$32.5m (noting that AMI budget period only extends to FY16 – and we have added \$1.0m for FY17)
- some additional Arrow International project management costs of \$18m which, , were identified subsequent to our detailed modelling as having been excluded from the individual DRA data supplied to us for our analysis

For practical reasons, for this valuation we have included this additional Arrow cost when calculating our CHE loading. While there is a distinct shape by year to CeMAT’s budgeted expenses, we expect that Arrow’s expenses will not follow the same shape. In our valuation we have made the pragmatic assumption that claims handling costs will follow the shape of the underlying gross claim payments. Table 5.1 sets out the information used to derive the loading of 3%.

**Table 5.1 – Derivation of Claims Handling Expense Loading**

	DRA Status		Total
	Completed	To be done	
<b>Reconciliation of Arrow Costs</b>			
No of properties	1,700	3,400	5,100
Contract Set up	5.9		
PMO Costs	█		
DRA	3.9		
In DRA data \$m	█	42.0	█
Added to CHE \$m	6.0	12.0	18.0
	█	54.0	█
\$ per DRA in data	12,351	12,351	12,351
\$ per DRA in CHE	3,529	3,529	3,529
<b>Total</b>	<b>15,880</b>	<b>15,880</b>	<b>15,880</b>
Gross Rebuild + Repair (inc cash settlements)			1,795
Total Arrow Cost %			█%
<b>Calculation of CHE Loading</b>			
		\$m	\$m
CeMAT Budget \$m	FY12	13.4	
	FY13	8.6	
	FY14	5.0	
	FY15	2.7	
	FY16	1.8	
	FY17	1.0	32.5
Add Arrow Cost not in DRA data			18.0
<b>Total CHE adopted for Valuation</b>			<b>50.5</b>
<b>Future Inflated Payments (net of EQC contribution)</b>			<b>1,702</b>
<b>CHE % Payments</b>			<b>3.0%</b>

withheld under section 9(2)(b)(ii)

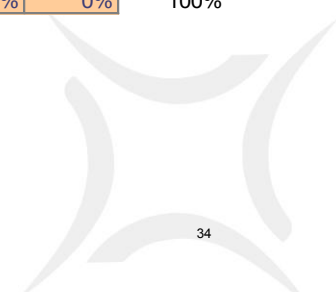
## 5.2 Claim Payment Patterns

At this point in time, AMI has only paid a very small proportion of its ultimate liability. We have arbitrarily selected a payment pattern which allows for around 70%-75% of AMI's gross liability to be paid over the course of the next 2 years, with the remainder to spread out until FY2017. This pattern assumes that the Government's land remediation package, together with the desire of some claimants not to "wait their turn in the queue", will lead to a fairly material number of cash settlements occurring – and, of course, a good proportion of those that are repairs and those who choose to rebuild will be commenced within the next 12-24 months. Table 5.2 sets out the claim payment patterns we have adopted.

**Table 5.2 – Assumed Claim Payment Patterns**

			Financial year						
			FY12	FY13	FY14	FY15	FY16	FY17	Total
<b>4 Sept 10 Darfield</b>	<b>Over EQC Cap</b>	<b>Gross Amount</b>	35%	35%	20%	5%	3%	2%	100%
		<b>EQC Recovery</b>	35%	35%	20%	5%	3%	2%	100%
	<b>Out of Scope</b>		45%	35%	20%	0%	0%	0%	100%
	<b>Lost Rent</b>		50%	50%	0%	0%	0%	0%	100%
	<b>Temp Accom</b>		40%	40%	15%	5%	0%	0%	100%
	<b>Contents</b>		75%	25%	0%	0%	0%	0%	100%
	<b>Vehicles</b>		100%	0%	0%	0%	0%	0%	100%
<b>Other</b>		45%	35%	20%	0%	0%	0%	100%	
<b>22 Feb 11 Lyttleton</b>	<b>Over EQC Cap</b>	<b>Gross Amount</b>	30%	40%	20%	5%	3%	2%	100%
		<b>EQC Recovery</b>	30%	40%	20%	5%	3%	2%	100%
	<b>Out of Scope</b>		35%	45%	20%	0%	0%	0%	100%
	<b>Lost Rent</b>		40%	60%	0%	0%	0%	0%	100%
	<b>Temp Accom</b>		40%	40%	15%	5%	0%	0%	100%
	<b>Contents</b>		65%	30%	5%	0%	0%	0%	100%
	<b>Vehicles</b>		95%	5%	0%	0%	0%	0%	100%
<b>Other</b>		40%	35%	25%	0%	0%	0%	100%	
<b>13 June Sumner</b>	<b>Over EQC Cap</b>	<b>Gross Amount</b>	30%	40%	20%	5%	3%	2%	100%
		<b>EQC Recovery</b>	30%	40%	20%	5%	3%	2%	100%
	<b>Out of Scope</b>		35%	45%	20%	0%	0%	0%	100%
	<b>Lost Rent</b>		40%	60%	0%	0%	0%	0%	100%
	<b>Temp Accom</b>		40%	40%	15%	5%	0%	0%	100%
	<b>Contents</b>		65%	30%	5%	0%	0%	0%	100%
	<b>Vehicles</b>		95%	5%	0%	0%	0%	0%	100%
<b>Other</b>		40%	35%	25%	0%	0%	0%	100%	
<b>Minor Events</b>	<b>Over EQC Cap</b>	<b>Gross Amount</b>	30%	40%	20%	5%	3%	2%	100%
		<b>EQC Recovery</b>	30%	40%	20%	5%	3%	2%	100%
	<b>Out of Scope</b>		35%	45%	20%	0%	0%	0%	100%
	<b>Lost Rent</b>		40%	60%	0%	0%	0%	0%	100%
	<b>Temp Accom</b>		40%	40%	15%	5%	0%	0%	100%
	<b>Contents</b>		65%	30%	5%	0%	0%	0%	100%
	<b>Vehicles</b>		95%	5%	0%	0%	0%	0%	100%
<b>Other</b>		40%	35%	25%	0%	0%	0%	100%	

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### 5.3 Future Claims Inflation

We have selected a range of inflation rates for the different types of cover, as set out in Table 5.3

**Table 5.3 – Adopted Claims Inflation Rates**

Cover Type	Financial year					
	FY12	FY13	FY14	FY15	FY16	FY17
<b>Over EQC Cap Gross Amount EQC Recovery</b>	0.0%	6.0%	6.0%	6.0%	6.0%	6.0%
	0.0%	3.0%	3.0%	3.0%	3.0%	3.0%
<b>Out of Scope</b>	0.0%	6.0%	6.0%	6.0%	6.0%	6.0%
<b>Lost Rent</b>	0.0%	3.0%	3.0%	3.0%	3.0%	3.0%
<b>Temp Accom</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Contents</b>	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
<b>Vehicles</b>	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
<b>Other</b>	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

AMI's major exposure to adverse future inflation is, of course, for building repair and rebuild costs, where there is a material risk of demand surge creating a one-off rapid escalation in costs. Our selected uniform rate of 6% per annum for building cost inflation beyond FY12 is based on some advice and estimates provided to us by New Zealand Treasury. For FY12, we have adopted 0% inflation, on the basis that:

- Arrow have indicated that the DRA estimates reflect contract values that can be achieved in current conditions and are likely to hold for the remainder of the 2012 calendar year
- The DRA estimates also contain contingency margins which amount to around 8% of assessed building works, hence there is already a buffer within the estimates themselves which should cover any building cost inflation that may emerge in the later part of FY12

It should also be noted that it is at the gross repair/rebuild cost level that building cost inflation impacts. The fact that the EQC contribution is capped at a maximum of \$100,000 per claim means that the EQC contribution will not escalate at the same rate that overall costs may. To cater for this we have (arbitrarily) adopted a lower rate of inflation of 3% per annum to apply to the EQC component of the projected gross repair/rebuild cost.

For Temporary accommodation, we have not allowed for any future claims inflation, on the basis that the case estimates for claims under this cover have already been set at AMI's maximum liability of 25% of the Contents sum insured. For Loss of Rent claims, we have assumed that the majority of payments in FY12 are for claims which have already commenced payment and hence no further inflation in FY12 need be allowed for. For future years and for other covers (all years including FY12), we have adopted a rate of 3% per annum, in line with the general level of economic inflation in New Zealand.

## 5.4 Discount Rate

For the valuations at 30 June 2011 and for the valuation at 7 April 2011, we have adopted the risk free zero coupon discount rates as published by New Zealand Treasury, as set out in Table 5.4.

**Table 5.4 – Adopted Discount Rates**

Balance date	Financial year					
	FY12	FY13	FY14	FY15	FY16	FY17
30 June 2011	2.74%	3.09%	3.55%	3.96%	4.30%	4.58%
07 April 2011	2.57%	3.20%	3.80%	4.33%	4.79%	5.17%

## 5.5 Risk Margin

We understand that RBNZ has indicated to AMI that it should prepare its EQ provisions on the basis of a 75% probability of sufficiency. The risk margin we have adopted is intended to be consistent with this.

In our BAU valuation we apply a quite formally structured process to derive appropriate risk margins for each of AMI's insurance classes. The unique and unprecedented nature of the earthquake events precludes following a similar path for AMI's EQ liabilities. The margin we have adopted has been arrived at after considering:

- the risk margins applying to AMI's business as usual claim liabilities
- the risk margins generally adopted for claims liabilities for a range of other insurance classes
- the results of some sensitivity tests on our overall valuation result – which were used to test the range of adverse experience which might be needed to extinguish the risk margin adopted.

The risk margins incorporated in our recommended provisions have been calculated as a percentage of the gross discounted central estimate but, where there is still room for reinsurance recoveries (i.e. where the inflated gross estimate is below the limit of the reinsurance cover), the risk margin is reduced by the present value of the remaining available reinsurance cover.

For this valuation we have adopted a risk margin of 14.2%, but as noted above the dollar value arising from applying this loading is offset where there is the potential for further reinsurance recoveries.

### Relationship to BAU Risk Margins

At the moment, there is considerable uncertainty attaching to many elements of the likely ultimate cost of AMI's EQ liabilities. At some point in the future (probably 18-24 months

away), AMI's EQ liabilities will have matured sufficiently to attract a "more normal" level of uncertainty, for a number of reasons:

- all of the Over Cap claims will have been formally assessed
- issues relating to application of multiple EQC caps and to the Government's land remediation package will be known
- the potential impact of demand surge on building costs will be better understood and less of a risk.

We would therefore expect that the risk margin for AMI's EQ liabilities will reduce over this period and at the June 2013 balance date, say, may revert to a level approaching the level currently applying to AMI's House claim liabilities. AMI's BAU claim liabilities currently incorporate risk margins (at a 75% probability of sufficiency) ranging between 5.7% and 7.8%, with a margin of 7.1% applying to AMI's House claim liabilities.

Clearly, in the meantime the margin should be materially higher. Our selected risk margin of 14.2% was (almost arbitrarily) chosen at a level which was double the existing margin for House (i.e. 14.2%, compared to 7.1%). Subjecting this to some reasonableness tests, as described below, indicated that a margin of this level was "in the right ballpark".

#### Benchmark against Sensitivity Tests

Application of the risk margin as described above results in an amount of \$218m being added to our net central estimate of AMI's EQ liabilities.

In section 8 of this report we set out the results of a number of sensitivity tests on our overall valuation result. These show that it takes some quite adverse outcomes on the main assumptions to increase our net central estimates by amounts which would extinguish the risk margins included in our recommended provisions.

On this basis, we believe that the margin we have adopted is sufficient to satisfy the requirement of having a probability of sufficiency of at least 75%.

#### Benchmark Against Other Risk Margins

One class which we identified as having some commonality in the nature of the run-off risks involved is the Australian class of business Motor Third Party Bodily Injury (CTP):

- it is a class which is long tail (and admittedly much longer tailed than AMI's EQ liabilities)
- while the ultimate volume of claims can be projected from existing patterns at a reasonably early stage, there is difficulty in identifying early on what the severity profile of claims will be

- it is a class which can be subject to sudden surges in claim inflation, with such surges affecting the cost of all claims still to be settled (i.e. not just new claims arising).

Risk margin modelling on this class of business and surveys of the practices of Australian insurers indicates 75% PoS risk margins of the order of 10% - a level which is materially lower than the 14.2% margin underpinning the calculation of risk margins adopted in this report for the valuation of AMI's EQ liabilities.

### Overall View

The above considerations, when taken in conjunction with the full set of sources of systemic risk (both internal and external) suggest that a risk margin of the order of 14% represents a suitable level for producing a 75% probability of sufficiency in AMI's EQ provisions.

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## 6 Reinsurance Recoveries

### 6.1 AMI's Reinsurance Covers

Our projection of AMI's EQ liabilities indicates that AMI will obtain reinsurance recoveries in respect of four of the events – the three major events as well as the 26 December 2010 event. During FY11, AMI had in place two forms of reinsurance cover applicable to the EQ losses incurred. Under its main catastrophe excess-of-loss programme, for the September 2010, the December 2010 and the February 2011 events the cover purchased was for losses of up to \$600m (subject to a deductible of \$5m). After the February 2011 event, a further layer of cover was purchased extending the amount of cover to \$1,000m, but noting that the deductible applying to a fourth event effectively became the loss incurred on the December 2010 event. A series of three aggregate excess-of-loss covers were also in place to protect AMI against an aggregation of retained losses (as detailed below).

### 6.2 Recoveries – Aggregate Programme

Table 6.1 sets out our allocation of aggregate reinsurance recoveries, which has been calculated in strict order of occurrence of events

**Table 6.1 – Reinsurance Recoveries From Aggregate Covers**

Event	Agg. Cover 1		Agg. Cover 2		Agg. Cover 3		Total Recovery by Event \$000
	Start	Finish	Start	Finish	Start	Finish	
	Deductible	Cover limit	Deductible	Cover limit	Deductible	Cover limit	
	Contrib \$000	Recov. \$000	Contrib \$000	Recov. \$000	Contrib \$000	Recov. \$000	
91 - NE NORTH ISLAND 1-2/6/10	1,950	0	0	0	0	0	0
93 - CHRISTCHURCH EQ 4 SEPT 10	2,750	0	0	0	0	0	0
96 - NZ STORM 17/19 SEPT 2010	1,216	917	0	0	0	0	917
97 - CHRISTCHURCH EQ 19 OCT 10	1,135	1,135	0	0	0	0	1,135
98 - STH IS GALES 21-22/12/10	95	95	0	0	0	0	95
99 - CHRISTCHURCH EQ 26 DEC 10	2,750	2,750	2,000	0	0	0	2,750
100 - NZ STORM 27-28/12/10	1,205	104	0	0	0	0	104
105 - CYCLONE WILMA 28-30/1/11	0	0	0	0	808	0	0
106 - CHC EQ 22 FEB 11	0	0	2,000	2,000	2,250	0	2,000
107 - CHC EQ 16 APR 11	0	0	0	0	1,245	0	0
108 - CENTRAL NTH ISLAND STORM	0	0	0	0	526	0	0
112 - CHCH EQ 13/6/11	0	0	2,000	2,000	2,250	2,079	4,079
<b>Total</b>	<b>11,102</b>	<b>5,000</b>	<b>6,000</b>	<b>4,000</b>	<b>7,079</b>	<b>2,079</b>	<b>11,079</b>

<b>Total attributable EQ events</b>	<b>9,964</b>
<b>Amount already claimed</b>	<b>-1,862</b>
<b>R/I recoveries o/s at 30 June 2011</b>	<b>8,102</b>

This shows that \$9.9m of the total recoveries should be allocated to EQ, with \$8.1m being outstanding at 30 June 2011.

### 6.3 Recoveries - Main Catastrophe Programme

Table 6.2 sets out projected reinsurance recoveries from the main catastrophe programme for each of the 4 events

**Table 6.2 – Projection of Reinsurance Recoveries (Main Programme)**

Projected Reinsurance Recoveries \$m	FY11	FY12	FY13	FY14	FY15	FY16	FY17+
<b>04 September 2010</b>							
Cumulative Paid	33.7	151.1	299.0	434.7	521.1	574.8	602.8
CHE Allowance	1.0	4.5	9.0	13.0	15.6	17.2	18.1
	34.7	155.6	308.0	447.7	536.7	592.0	620.9
Cum Reinsurance Recoverable	29.7	150.6	303.0	442.7	531.7	587.0	595.0
Incremental RI Recoverable	<b>29.7</b>	<b>121.0</b>	<b>152.4</b>	<b>139.7</b>	<b>89.0</b>	<b>55.3</b>	<b>8.0</b>
<b>26 December 2010</b>							
Cumulative Paid	0.3	3.6	8.0	10.5	11.9	12.1	12.2
CHE Allowance	0.0	0.1	0.2	0.3	0.4	0.4	0.4
	0.4	3.7	8.2	10.8	12.3	12.5	12.6
Cum Reinsurance Recoverable	0.0	0.0	3.2	5.8	7.3	7.5	7.6
Incremental RI Recoverable	<b>0.0</b>	<b>0.0</b>	<b>3.2</b>	<b>2.6</b>	<b>1.4</b>	<b>0.2</b>	<b>0.1</b>
<b>22 February 2011</b>							
Cumulative Paid	11.6	249.7	537.4	793.5	955.4	1,054.6	1,106.4
CHE Allowance	0.3	8.0	18.1	23.1	24.2	24.8	25.3
	11.9	257.7	555.5	816.6	979.5	1,079.4	1,131.7
Cum Reinsurance Recoverable	6.9	252.7	550.5	595.0	595.0	595.0	595.0
Incremental RI Recoverable	<b>6.9</b>	<b>245.8</b>	<b>297.7</b>	<b>44.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>13 June 2011</b>							
Cumulative Paid	0.0	19.8	44.6	65.6	78.7	86.2	90.2
CHE Allowance	0.0	0.7	1.5	2.0	2.1	2.1	2.2
	0.0	20.4	46.1	67.6	80.8	88.3	92.3
Cum Reinsurance Recoverable	0.0	7.9	33.5	55.0	68.2	75.8	79.8
Incremental RI Recoverable	<b>0.0</b>	<b>7.9</b>	<b>25.7</b>	<b>21.5</b>	<b>13.2</b>	<b>7.6</b>	<b>4.0</b>
<b>All Events Combined</b>							
Incremental RI Recoverable	<b>36.6</b>	<b>374.7</b>	<b>479.0</b>	<b>208.3</b>	<b>103.7</b>	<b>63.0</b>	<b>12.1</b>

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## 7 Outstanding Claims Valuation Results

### 7.1 Summary of Liabilities at 30 June 2011

Table 7.1 sets out a summary of our recommended provisions or AMI's EQ liabilities as at 30 June 2011 and Table 7.2 sets out a breakdown of the liabilities relating to the minor events

**Table 7.1 – Summary of Outstanding Claims at 30 June 2011**

Provisions for Outstanding Claims as at 30 June 2011	Cat 93	Cat 106	Cat 112	Total		
	4-Sep-10 \$m	22-Feb-11 \$m	13-Jun-11 \$m	Major \$m	Minor \$m	Overall \$m
<b>Gross Outstanding Claims</b>						
In 30 June 2011 Values	515	1,000	83	1,597	17	1,615
Allowance for Future Inflation	29	53	4	87	1	88
Inflated Values	544	1,053	87	1,684	18	1,702
Discount to Present Value	-29	-56	-5	-90	-1	-90
<b>OSC Discounted to 30 June 2011</b>	<b>516</b>	<b>996</b>	<b>82</b>	<b>1,595</b>	<b>17</b>	<b>1,612</b>
Claims Handling						
<b>Gross Central Estimate</b>						
Catastrophe R/I Recoveries	-531	-572	-72	-1,176	-7	-1,183
Aggregate R/I Recoveries	0	-2	-4	-6	-2	-8
<b>Net Central Estimate</b>	<b>0</b>	<b>452</b>	<b>9</b>	<b>461</b>	<b>9</b>	<b>469</b>
Risk Margin						
<b>Recommended provision</b>						
<b>Inflated Gross Central Estimate (Incl paid to date + CHE)</b>	<b>595</b>	<b>1,090</b>	<b>89</b>	<b>1,774</b>	<b>19</b>	<b>1,793</b>

**Table 7.2 – Details for Minor Events**

Provisions for Outstanding Claims as at 30 June 2011	Cat 97	Cat 99	Cat 103	Cat 107	Cat 111	Cat 114	Total \$m
	19-Oct-10 \$m	26-Dec-10 \$m	20-Jan-11 \$m	16-Apr-11 \$m	6-Jun-11 \$m	21-Jun-11 \$m	
<b>Gross Outstanding Claims</b>							
In 30 June 2011 Values	1.3	11.2	0.6	2.0	0.7	1.3	17.2
Allowance for future inflation	0.1	0.4	0.0	0.1	0.0	0.1	0.7
Inflated Values	1.4	11.6	0.7	2.1	0.7	1.4	17.9
Discount to present value	-0.1	-0.5	0.0	-0.1	0.0	-0.1	-0.8
<b>OSC discounted to 30 June 2011</b>	<b>1.3</b>	<b>11.1</b>	<b>0.6</b>	<b>2.0</b>	<b>0.7</b>	<b>1.3</b>	<b>17.1</b>
Claims Handling	0.0	0.3	0.0	0.1	0.0	0.0	0.5
<b>Gross Central Estimate</b>	<b>1.3</b>	<b>11.5</b>	<b>0.7</b>	<b>2.1</b>	<b>0.7</b>	<b>1.4</b>	<b>17.6</b>
Catastrophe R/I Recoveries	0.0	-6.9	0.0	0.0	0.0	0.0	-6.9
Aggregate R/I Recoveries	-1.1	-0.9	0.0	0.0	0.0	0.0	-2.0
<b>Net Central Estimate</b>	<b>0.2</b>	<b>3.7</b>	<b>0.7</b>	<b>2.1</b>	<b>0.7</b>	<b>1.4</b>	<b>8.7</b>
Risk Margin	0.2	0.0	0.1	0.3	0.1	0.2	0.9
<b>Recommended provision</b>	<b>0.4</b>	<b>3.7</b>	<b>0.7</b>	<b>2.3</b>	<b>0.8</b>	<b>1.6</b>	<b>9.5</b>
<b>Inflated Gross Central Estimate (Incl paid to date + CHE)</b>	<b>1.5</b>	<b>12.3</b>	<b>0.7</b>	<b>2.2</b>	<b>0.7</b>	<b>1.4</b>	<b>19.0</b>

Our overall recommended provision for AMI's EQ liabilities, net of reinsurance recoveries, at 30 June 2011 is \$687m. Key points to note include:

- Across all events, our gross central estimate of the AMI's EQ liabilities at 30 June 2011 (before adding claims handling expense) is \$1,612m, with \$1,595m relating to the three major events and \$17m relating to the six minor events
- The allowance for claims handling is based on a loading of 3% of the discounted gross outstanding claims; it encompasses the projected cost of AMI's earthquake claims operation ("CeMAT") of \$32m, together with an amount of \$18m to cover the portion of Arrow International's overall assessment and project management costs which were not included in the individual assessment data supplied to us for this valuation
- As the line of figures underneath the table indicates:
  - ▶ Cat 93 (the 4 September 2010 event) is currently estimated to ultimately cost \$595m (in inflated \$); as such this event is very close to the limit of the amount of reinsurance cover purchased for this event (\$600m)
  - ▶ Cat 106 (the 22 February 2011 event) has an estimate (in inflated \$) of \$1,090m, which is well in excess of the available reinsurance cover of \$600m
  - ▶ Cat 112 (the 13 June 2011 event) has an estimated inflated cost of the order of \$89 million, which falls well below the maximum reinsurance cover for this event of \$1,000m
- The present value of recoveries expected to be made from AMI's reinsurance covers total \$1,191m, with \$1,183m coming from the main catastrophe programme and \$8m coming from the three aggregate covers which were in place for various periods of time during which these events occurred
- After deduction of reinsurance recoveries, across all events, our net central estimate of AMI's EQ liabilities is \$469m, with the majority of this (\$452m) being due to the loss from the 22 February 2011 event going through the top of the reinsurance cover available for this event
- Our recommended provisions incorporate risk margins of \$218m; this is calculated as 14.2% of our gross central estimate of liabilities, but noting that to the extent that the assessed loss for an event is expected to fall below the available reinsurance cover, the risk margin is offset by a potential reinsurance recoverable; this applies to the September event (\$4m) and to the June 2011 event (\$12m).

## 7.2 Uncertainty

At the point in time of preparing this valuation, it must be stressed that a relatively large degree of uncertainty attaches to our estimates of AMI's EQ liabilities. As noted in Section 5, in recognition of this uncertainty, we have incorporated a risk margin of 14.2% in our recommended provisions – a level which is intended to produce a 75% probability of sufficiency.

This margin is considerably higher than the margins applying to AMI's other claim liabilities and is based largely on subjective judgements as to the appropriate margin to apply.

To illustrate the potential for the actual runoff experience to vary from the basis underpinning our central estimate we have applied a range of sensitivity tests to our valuation result. These are set out in Table 7.3 below (noting that they are sorted in ascending order of the net central estimate) and are based around varying the following parameters in our projection model:

- Scenarios A and F relate to our estimates of the ultimate number of Over Cap claims being lower and higher than adopted in our central estimate
- Scenarios B, E and H test a range of building cost inflation environments
- Scenarios C and G examine the impact on the result of varying the percentage of damage allocated back to the September 2010 event for properties whose first AMI Over Cap claim was recorded for the February 2011 event
- Scenario D tests the impact of the payment pattern being slower than adopted
- Scenario I tests the impact of a 10% deterioration in average Over Cap claim sizes (over and above the contingency margin already incorporated in DRAs)
- Scenarios J and K examine the effect of combining some of the above scenarios.

We have also shown the estimated ultimate inflated gross cost including claims handling expenses for each of September 2010 and February 2011. These are useful in understanding the extent to which AMI's reinsurance cover is utilised under the different scenarios.

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Table 7.3 – Summary of Sensitivity Tests

Scenario	Description	Outstanding claims at 30 June 2011						Inflated Cost \$m		
		Gross Amount O/S			Net of Reinsurance			(incl Paid+CHE)		
		\$m	\$ Diff	\$ Diff %	\$m	\$ Diff	\$ Diff %	Sept 2010	Feb 2011	All Events
				Gross			Gross			
<b>A</b>	Number of Over Cap Claims lower than adopted by 260 for Sep & 300 for Feb	1,554	-108	-6%	416	-55	-3%	540	1,034	1,683
<b>B</b>	Building Cost inflation 3% p.a. instead of 6% p.a.	1,614	-48	-3%	442	-29	-2%	577	1,061	1,742
<b>C</b>	% of Feb cost allocated to Sep same as completed DRAs	1,666	4	0%	466	-5	0%	646	1,047	1,800
<b>Base</b>	<b>Central estimate</b>	<b>1,662</b>	<b>0</b>	<b>0%</b>	<b>471</b>	<b>0</b>	<b>0%</b>	<b>596</b>	<b>1,092</b>	<b>1,795</b>
<b>D</b>	Payment pattern materially slower. More uniform over 3-4 years	1,681	19	1%	503	32	2%	621	1,132	1,864
<b>E</b>	High Building Cost inflation - 10% p.a. for each of FY13-FY15, 8% in FY16, 6% in FY17	1,726	64	4%	526	55	3%	621	1,132	1,865
<b>F</b>	Number of Over Cap Claims higher than adopted by 170 for Sep & 200 for Feb	1,733	71	4%	534	63	4%	632	1,130	1,870
<b>G</b>	Only 5% of Feb cost allocated to Sep	1,701	39	2%	547	76	5%	556	1,170	1,834
<b>H</b>	Extreme Building Cost inflation - 15/15/12/10/8/6 for FY13-FY17	1,785	123	7%	581	110	7%	644	1,170	1,929
<b>I</b>	Average Repair/Rebuild Cost 10% (\$20k) higher than indicated by completed DRAs	1,784	122	7%	583	112	7%	640	1,173	1,922
<b>J</b>	Combination of E + I	1,851	189	11%	647	176	11%	667	1,217	1,996
<b>K</b>	Combination of E + I + F	1,934	272	16%	727	256	15%	709	1,261	2,082

In relation these results, the following observations are made:

- Scenarios A to C (producing favourable outcomes) and Scenarios D to G (producing mildly unfavourable outcomes) represent variances which we would consider as being not particularly abnormal and, as such, variations in the ultimate outcome of the order indicated by these scenarios (+/- \$50m-\$70m) should be expected
- Scenarios H to K (and particularly K) represent scenarios for which the runoff experience has been adverse, with K in particular representing a set of circumstances which we would judge as being more remote than the 75<sup>th</sup> percentile of the distribution of possible outcomes.
- Regarding the inflated costs:
  - ▶ As expected, there are no favourable scenarios which would bring the cost of the February event back close to the available reinsurance protection
  - ▶ For the September 2010 event, the range of outcomes shows that while our central estimate is close to the limit of AMI's reinsurance cover, the ultimate result could readily vary by the order +/- \$50m; not surprisingly, the outcome for this event is quite sensitive to the allocation given to the September for Over cap February claims.

- It is only when we combine unfavourable outcomes on some of the key parameters that the value of AMI's EQ liabilities increases by amounts approaching the risk margin incorporated in our recommended provisions.

### 7.3 Summary of Liabilities at 7 April 2011

Table 7.4 sets out a summary of our recommended provisions or AMI's EQ liabilities as at 7 April 2011. In arriving at these estimates, our approach has been to:

- Remove any events which happened subsequent to 7 April 2011
- Add back any payments made in the period from 8 April 2011 to 30 June 2011
- Adjust the discount rates to reflect the risk free yield curve in place on 7 April 2011.

**Table 7.4 – Summary of Outstanding Claims at 7 April 2011**

Provisions for Outstanding Claims as at 7 April 2011	Cat 93	Cat 106	Major	Cat 97	Cat 99	Cat 103	Minor	Overall \$m
	4-Sep-10 \$m	22-Feb-11 \$m	Total \$m	19-Oct-10 \$m	26-Dec-10 \$m	20-Jan-11 \$m	Total \$m	
<b>Gross Outstanding Claims</b>								
In 30 June 2011 Values	533	1,009	1,542	0	0	0	14	1,556
Allowance for Future Inflation	37	66	103	1.4	11.6	0.7	1	104
Inflated Values	570	1,075	1,645	0.1	0.4	0.0	14	1,660
Discount to Present Value	-36	-68	-104	1.5	12.0	0.7	-1	-104
<b>OSC Discounted to 7 April 11</b>	<b>535</b>	<b>1,007</b>	<b>1,542</b>	<b>1.4</b>	<b>11.4</b>	<b>0.7</b>	<b>14</b>	<b>1,555</b>
Claims Handling	16	30	46	0.0	0.3	0.0	0	47
<b>Gross Central Estimate</b>	<b>551</b>	<b>1,037</b>	<b>1,588</b>	<b>1.4</b>	<b>11.8</b>	<b>0.7</b>	<b>14</b>	<b>1,602</b>
Catastrophe R/I Recoveries	-551	-581	-1,132	0.0	-6.9	0.0	-7	-1,139
Aggregate R/I Recoveries	0	-2	-2	-1.1	-0.9	0.0	-2	-4
<b>Net Central Estimate</b>	<b>0</b>	<b>454</b>	<b>454</b>	<b>0.3</b>	<b>4.0</b>	<b>0.7</b>	<b>5</b>	<b>459</b>
Risk Margin	78	147	225	0.2	0.0	0.1	0	226
<b>Recommended provision</b>	<b>78</b>	<b>601</b>	<b>679</b>	<b>0.5</b>	<b>4.0</b>	<b>0.8</b>	<b>5</b>	<b>685</b>
<b>Inflated Gross Central Estimate (Incl paid to date + CHE)</b>	<b>604</b>	<b>1,102</b>	<b>1,706</b>	<b>1.5</b>	<b>12.4</b>	<b>0.8</b>	<b>15</b>	<b>1,721</b>

The net effect of the adjustments made has been to produce a recommended provision of \$685m, which is only \$4m different to our recommended provision at 30 June 2011

## 8 Reliance and Limitations

This report is being provided for the sole use of AMI for the purposes stated in Section 1 of this report. It is not intended, nor necessarily suitable, for any other purpose. This report should only be relied on by AMI for the purpose for which it is intended.

We understand that AMI may wish to provide a copy of the report to the auditors of AMI in connection with the audit of the 2011 financial statements. We also understand that AMI will need to provide this report to the Reserve Bank of New Zealand and to New Zealand Treasury. Permission is hereby granted for such distribution for this purpose on the condition that the entire report, rather than any excerpt, is distributed.

No other distribution of, use of or reference to this report (or any part thereof) is permitted without our prior written consent. Third parties, whether authorised or not to receive this report, should recognise that the furnishing of this report is not a substitute for their own due diligence and should place no reliance on this report or the data contained herein which would result in the creation of any duty or liability by Finity to the third party.

Finity has performed the work assigned and has prepared this report in conformity with its intended utilisation by a person technically competent in the areas addressed and for the stated purposes only. Judgements about the conclusions drawn in this report should be made only after considering the report in its entirety, as the conclusions reached by a review of a section or sections on an isolated basis may be incorrect.

The report should be considered as a whole. Members of Finity staff are available to answer any queries, and the reader should seek that advice before drawing conclusions on any issue in doubt.

We have relied on the accuracy and completeness of all data and other information (qualitative, quantitative, written and verbal) provided to us for the purpose of this report. We have not independently verified or audited the data, however we have reviewed the data for general reasonableness and consistency. It should be noted that if any data or other information is inaccurate or incomplete, we should be advised so that our advice can be revised, if warranted.

It is not possible to put a value on outstanding claim liabilities with certainty. As well as difficulties caused by limitations on the historical information, outcomes remain dependent on future events, including legislative, social and economic forces. Although we consider that the estimates have been prepared in conformity with what we believe to be the likely future experience, actual experience could vary considerably from our estimates. Deviations from our estimate, perhaps material, are normal and are to be expected.

It has been assumed that any amounts arising from the reinsurance programs protecting AMI will be fully recoverable on a prompt basis. If any reinsurance proves not to be

recoverable (either through insolvency of a reinsurer or contract dispute) the net liability of AMI could be higher. We are not aware of any current reinsurer solvency problems or disputes over reinsurance recoveries.

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