3. Identification of hazards and risks for Taranaki

3.1 Risk analysis and evaluation

The CDEM Act 2002 requires CDEM Group Plans to take an 'all hazards' approach to improve and promote the sustainable management of hazards, enable communities to achieve acceptable levels of risk, as well as plan and prepare for emergency response and recovery. CDEM Group Plans are therefore expected to take a consequence-based approach to civil defence emergency management planning.

The purpose of this section of the Group Plan is to therefore provide an outline of the hazard and risk analysis process undertaken as part of the development of the Group Plan. This process required a clear understanding of the key features of Taranaki (as outlined in the Taranaki context section of this Group Plan – section 7) and involved the following three steps:

- Step One: Identify hazards and describe the risks
- Step Two: Analyse risks
- Step Three: Evaluate risk

The results of the risk analysis and evaluation are detailed in the document '*Hazard and risk analysis: explanatory notes*' that are to be read as background information for this section of the Group Plan.

Step One: Identify hazards and describe risks

The **first phase** of Step One was to identify all hazards relevant to the CDEM Group for Taranaki. The Resource Management Act requires local authorities to keep information about the natural hazards relevant to their communities (section 35(5)(j) of the RMA). The 1991 hazard analysis[4] formed the basis of this information and was amended to include the 'all hazards' approach of the new CDEM Act 2002. The hazard list was then refined to remove hazards that are not relevant to the CDEM Group for Taranaki and resulted in ten hazards being identified as significant hazards for the region. More detail of the hazards initially assessed in this phase of step one is provided in the document '*Hazard and risk analysis: explanatory notes*'.

The **second phase** of this step was to describe the risk impacts of each hazard. Risk is defined as 'the chance of something happening that will have an impact on people and property – measured in terms of consequences and likelihood[5]'. The explanatory notes provided include detail of the scenarios identified for each of the ten significant hazards.

Step Two: Analyse risks

Step Two involved a risk analysis process to determine the likelihood and consequences of risk and its associated level. The Ministry of Civil Defence & Emergency Management guidelines for developing a CDEM Group Plan recommend the use of the AS / NZS 4360 qualitative assessment technique as the standard approach to analyse the consequences of impact and likelihood of events. This model measures the *likelihood* (levels 1 – 5) and

[4] *Taranaki Regional Council. 1991. Preliminary Hazard Analysis.*
[5] *Adapted from AS/NZS 4360: 1999 Section 1.3 Definitions (Ministry for Civil Defence and Emergency Management. Working Together: Developing a CDEM Group Plan. DGL 2/02.*

consequences of impact (levels A – E) for each hazard. The 'level of risk' is a combined result of both likelihood and impact, resulting in each hazard having a low, moderate, high or extreme level of risk.

Step Three: Evaluate risk

The evaluation of risks in Step Three involved both the prioritisation of categorised risks against established criteria and identification of key issues. Analysis was therefore used at the completion of the initial risk analysis (using AS/NZS 4360) to prioritise hazards based on the seriousness, management, urgency and growth (SMUG) characteristics of each hazard, as well as for the identification of key issues. The SMUG ratings from 1 – 5 (the higher the number the more serious the risk) are used to give each hazard a ranking, determining the primary and secondary hazards for Taranaki. The SMUG criteria are as follows:

- **Seriousness** – the relative impact in terms of people and/or dollars.
- **Manageability** – how difficult a hazard's risks are to address and the level of cross-sector management effort being applied across the 4 R's directly or indirectly.
- **Urgency** – the measure of how imperative or critical it is to address the risk (associated with the probability/likelihood of the risk from the hazard – including return period considerations).
- **Growth** – the rate at which the risk will increase (through an increase in the probability of the extreme event occurring, an increase in the exposure of the community, or a combination of the two).

3.2 Significant hazards in Taranaki

The AS/NZS 4360 and SMUG analysis process was used to determine the top ten 'significant hazards' in Taranaki. The identification of these significant hazards differs from previous hazard analysis work undertaken for Taranaki and is a reflection of the 'all hazards' approach to emergency management planning. The significant hazards identified for the Taranaki region are:

	NZS 4360	SMUG
• Public health threat	extreme	14
• Flooding – eastern hill country	extreme	14
• Earthquake – local fault	extreme	14
• Volcanic eruption – Egmont	extreme	13
• Flooding – Lower Waitara River	extreme	12.7
• Structural failure (inc. dam failure) – significant structure	mod – ext	11.6
• Essential utilities failure – small community water supply	mod – ext	11.6
• High winds/hurricane	high – ext	11.4
• Biological threat – exotic animal disease (cattle)	extreme	10.8
• Hazardous substance – spillage or leakage	high	10.2

These significant hazards and their associated likelihood and impacts are demonstrated in Figure **2**. The description of how these hazards were identified as 'significant hazards' for the Taranaki CDEM (i.e. the methods used) area is provided in the document '*Hazard and* *risk analysis: explanatory notes*'. A brief description of each of these hazards and associated graphics is also provided in section 4 of the Group Plan.

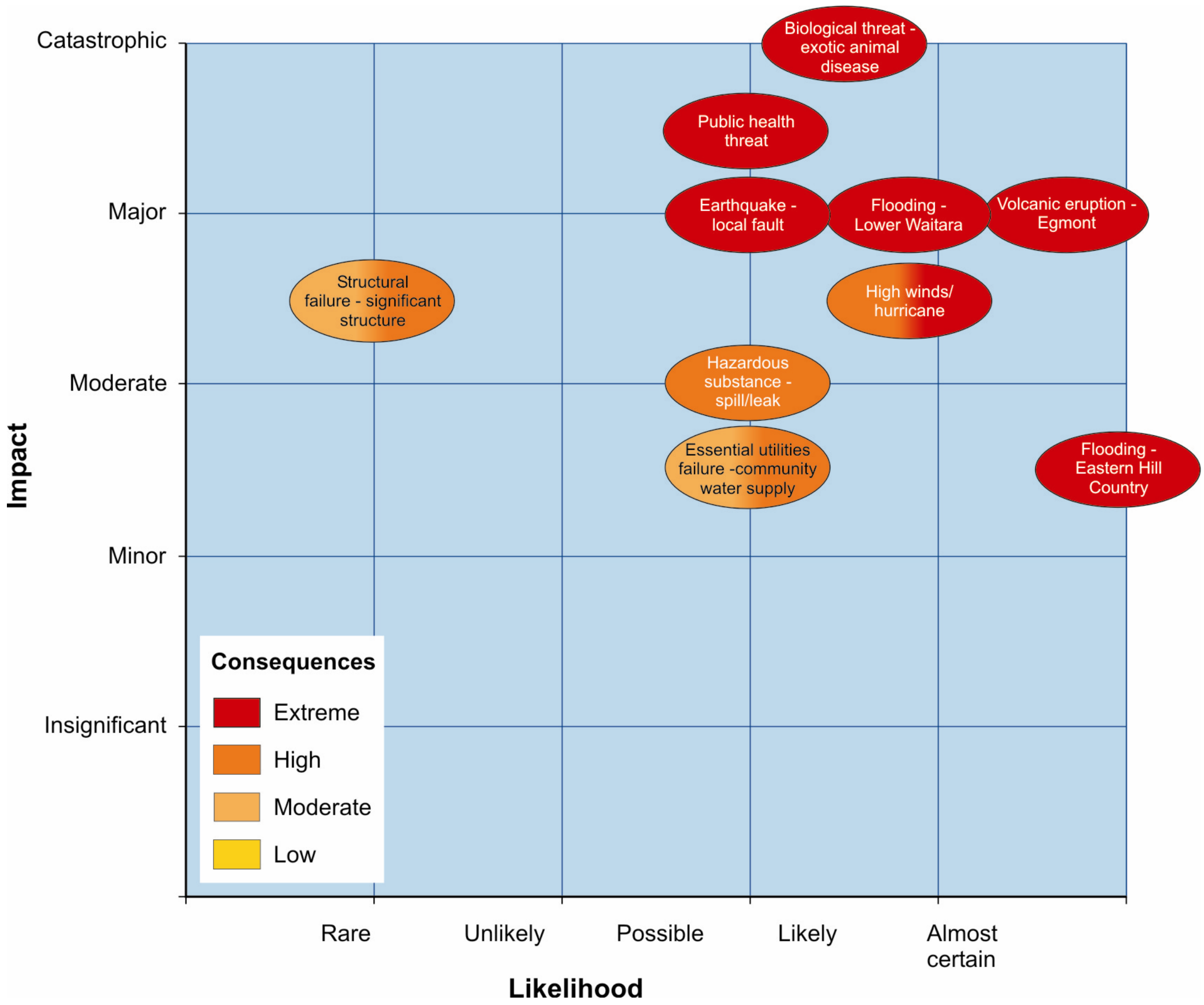

Figure 2 Significant hazards in Taranaki

Following Steps 1-3, further work is required to identify in greater detail:

- the consequences of each significant hazard (the effects of the event);
- responsibility for the management of each hazard (i.e. lead agencies);
- description of works that have already been done and by whom (mitigation work completed to-date);
- identification of any gaps and inconsistencies in this work (risk management); and
- the development of issues associated with each hazard (derived from the consequences and what we need to plan for).

In response to the above, a project will be undertaken by the CDEM Group to further refine the initial risk analysis work. This project will address areas such as:

- The hazard - the significant hazards for Taranaki.
- The impact areas:
  - People
  - Built environment
  - Natural environment
  - Society, and

- Economy
- Consequences - what are the consequences of each hazard on the various impact areas.
- The functions required to address the consequences.
- Identifying the lead agencies and supporting agencies.
- Identifying the mandates for response.
- Identifying existing processes and resources.
- Identifying function issues.
- Identifying potential actions.

This work has been identified as an action to occur within section 4 (Managing hazards and risks – reduction and readiness) of this Group Plan.

Nationally significant hazards
As a result of the process undertaken to identify the most significant hazards in Taranaki, the following have been acknowledged as hazards that are of national significance:

- Public health threat
- Volcanic eruption
- Biological threat

Furthermore, a terrorist attack was not included in the SMUG analysis due to it already being recognised as a hazard of national significance. Considerable effort has therefore been made at the national level to analyse this risk. An example of this from Taranaki could be a threat to the oil and gas industry.

3.3 Other hazards

As a result of the risk analysis and evaluation of all hazards in Taranaki, section 4 of the Group Plan focuses in more detail on the significant hazards for the Taranaki region (listed in section 3.2 above), rather than on other hazards. However, should any other hazardous event occur with significant consequences, the established systems and processes included in this Group Plan, together with the CDEM Act, will be sufficient to enable appropriate emergency response and recovery works to occur.

The management of these other hazards is also addressed in the Group Plan through:

- Section 4 - Managing the hazards and risks – reduction and readiness;
- Section 5 - Managing emergencies – response; and
- Section 6 - Managing emergencies – recovery.