

Nelson City Council

Dangerous Dams Policy 2006

November 2006

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1.0 Introduction and policy context

This document sets out the Dangerous Dams Policy adopted by Nelson City Council (the Council) in accordance with the new requirements of the Building Act 2004.

1.1 Dangerous Dams Policy

Section 161 of the Building Act 2004 requires all regional authorities (RAs) to adopt a policy on dangerous dams by 30 September 2006. The policy must state:

(a) the approach that the regional authority will take in performing its functions under this Part; and
(b) the regional authority's priorities in performing those functions; and
(c) how the policy will apply to heritage dams.

Nelson City Council, as a unitary authority, combines the functions of both a District and Regional Council and must therefore adopt a Dangerous Dam Policy.

1.2 Definitions

1.2.1 The definition of what constitutes a dam is set out in section 7 of the Building Act 2004:

Dam means:
(a) means an artificial barrier, and its appurtenant structures, that—
  (i) is constructed to hold back water or other fluid under constant pressure so as to form a reservoir; and
  (ii) is used for the storage, control, or diversion of water or other fluid; and
  (iii) retains 3 or more metres depth, and holds 20 000 or more cubic metres volume, of water or other fluid; and
(b) includes—
  (i) a flood control dam; and
  (ii) a natural feature that has been significantly modified to function as a dam; and
  (iii) a canal; but
(c) does not include a stopbank designed to control floodwaters

1.2.2 The definition of what constitutes a dangerous dam is set out in section 153 of the Building Act 2004 and in the related regulations that will define high potential and medium potential impact dams as well as moderate earthquakes and moderate floods.

153 Meaning of dangerous dam
A dam is **dangerous** for the purposes of this act if the dam –
(a) is a high potential impact dam or a medium potential impact dam (as defined in the regulations); and
(b) is likely to collapse –
  (i) in the ordinary course of events; or
  (ii) in a moderate earthquake (as defined in the regulations); or

(iii) in a moderate flood (as defined in the regulations); or

(c) is a leaky dam

1.3 Policy development process

Nelson City Council followed the special consultative procedure, (section 83 of the Local Government Act 2002), when developing and adopting this policy, and has had regard to any relevant principles in the Building Act 2004.

This policy will be reviewed every five years.

2.0 Policy approach

2.1 Policy context

Nelson City is characterised by a relatively compact geographical area with a modest population and no hydro-electricity generation. The city is an area that experiences moderate rainfall with occasional intense rainfall events and seasonal flooding. The relatively hilly catchment surrounding the city leads to a more rapid run-off of stormwater leading to shorter sharper flood events.

Nelson is also in a zone of moderately high seismicity with some quite complex geotechnical issues. These factors have contributed to the current situation where there are very few dams in the city. Those that have been constructed comprise a range of types and ages reflecting development over the last 100 years, from reinforced concrete dams to earth fill dams.

The dams that are found within the city are increasingly those required for water supply, rural fire fighting and stormwater detention purposes resulting from the increasing development of Nelson hillsides for residential development.

For a dam to be covered by the Building Act 2004 it must retain three (3) or more metres depth and hold 20,000 or more cubic metres volume of water or other fluid. This requirement means that only a small number of dams in Nelson City will be affected by the policy in particular and the Building Act 2004 in general.

2.2 Policy principles

Provisions of the Building Act in regard to dangerous dams reflect the Government's broader concern with the life safety of the public in areas that may be put at risk from the collapse of a dam and, more particularly, the need to address life safety in earthquakes and flood events.

The need for ongoing monitoring of dams has been signalled in the Building Act by the requirement for dam owners to prepare a dam safety assurance programme for medium and high potential impact dams. This programme is outside the scope and purpose of this policy.

Nelson City Council's Dangerous Dams Policy reflects the Council's determination to reduce the risks associated with dangerous dams in a way that is acceptable in social and economic terms to its ratepayers.

2.3 Overall approach

The development of a Dangerous Dams Policy is up to each regional authority and this policy has been developed after due consultation with Nelson City Council ratepayers and stake-holders in accordance with section 83 of the Local Government Act 2002.

In giving effect to this policy the Nelson City Council will:

a. review the City's dam stock to identify those that fall within the definition of a high potential impact dam or a medium potential impact dam under the Building Act 2004
b. require dam owners to assess the performance of those dams under a moderate earthquake or a moderate flood as defined in the regulations in the Building Act 2004 and confirm that the dam is not a leaky dam
c. determine from this broad assessment those dams that are dangerous in terms of the Building Act 2004
d. contact owners of these dams and invite them, within a specified time-frame, to meet with and/or obtain further details from the Council on future requirements
e. give written notices to all owners of dangerous dams once the deadline for meeting Council has passed and, subject to the results of discussions, to require them to carry out work to reduce or remove the danger or demolish the dam within a specified time-frame
f. allow owners a right of appeal as defined in the Building Act 2004, by applying for a determination under section 177

2.4 Identification of dangerous dams

Nelson City Council will take the following steps:

a. undertake an initial desktop review of Council files to assess which dams could fall within the definition of a high potential impact dam or a medium potential impact dam
b. inspect each dam where necessary
c. require these dam owners to carry out an initial evaluation of the dam to ensure it is not a leaky dam
d. require dam owners to do a detailed assessment of the dam's performance under a moderate earthquake or a moderate flood
e. A list of certified dangerous dams will be collated according to the results of the assessments. This list will categorise the identified dangerous dams according to the following:

Proposed Categorisation

Category 1: high potential impact dams
Category 2: medium potential impact dams
Category 3: high or medium impact dams with a heritage classification under the Nelson City Council's Resource Management Plan Appendix 1, or New Zealand Historic Places Trust register.

2.5 Response to complaints and dam documentation

In response to a complaint or receipt of documentation on a dam that signals that a dam may be dangerous, Nelson City Council will inspect the dam and determine whether it is a dangerous dam. Inspections will take place promptly on the receipt of a complaint or relevant documentation irrespective of the category of the dam.

2.6 Assessment criteria

The terms high potential impact dam, moderate potential impact dam, moderate earthquake and moderate flood are to be defined by regulations to the Building Act 2004.

At the date of adoption of this Dangerous Dams Policy the draft regulations propose to define the terms as follows:

High potential impact dam and Medium potential impact dam: The classification by a dam owner of any dam into these categories is likely to be based on an assessment of its potential impact category as reflected in an evaluation of loss of life, socio-economic, financial or environmental losses that might result from a failure of the dam.

Appended to this policy are tables outlining the current proposed evaluation parameters.

The terms moderate earthquake and moderate flood are proposed to be defined differently for the two impact categories for dams.

Moderate Earthquake is defined as follows:

Medium potential impact dam: An earthquake that would generate shaking at the site of the dam that is equal to the 1 in 150 annual exceedance probability earthquake shaking at that site.

High potential impact dam: An earthquake that would generate shaking at the site of the dam that is 1.3 times greater than the 1 in 150 annual exceedance probability earthquake shaking at that site.

In interpreting the definition of moderate earthquake for the purposes of the dangerous dam provisions of section 153 of the Act:

- the earthquake shaking at the site and the associated site hazard spectra shall be determined from the New Zealand Standard NZS 1170:2004 Structural Design Actions – Part 5: Earthquake Actions – New Zealand
- the earthquake shall be assumed to be as evaluated for the specific zone with a minimum magnitude of 6.5.

Moderate Flood is defined as follows:

Medium potential impact dam: A flood flowing into the reservoir created by the dam that is associated with 1.15 x 1 in 100 annual exceedance probability flood flow.

High potential impact dam: A flood flowing into the reservoir created by the dam that is associated with 1.4 x 1 in 100 annual exceedance probability flood flow.

The Council proposes to substitute these definitions, as well as the evaluation parameters set out in Appendix 1 of this policy, when confirmed by Government regulations.

2.7 Taking action on dangerous dams

Nelson City Council, on being satisfied that a dam is dangerous, will proceed as follows:

2.7.1 Provide information

Provide to the owner all information or reports obtained as a result of inspections or investigations.

2.7.2 Advise and liaise with owner and other agencies (including civil defence and emergency management agencies)

Advise and liaise with owners of dams identified as dangerous to discuss action to be taken.

2.7.3 Ensure Public Safety

Where appropriate Council will:

(a) put up a hoarding or fence to prevent people from approaching the dam nearer than is safe:
(b) attach in a prominent place on, or adjacent to, the dam a notice that warns people not to approach the dam:
(s.154 Building Act 2004)

2.7.4 Notice to owners

Where appropriate Council will:

(a) Give written notice requiring work to be carried out on the dam, within a time stated in the notice (which must not be less than 10 days after the notice is given under s.155) to reduce or remove the danger (s.154(1)(c) Building Act 2004).
(b) Fix the notice to the dam concerned (S.155(1)(a), and state whether the owner of the dam must obtain a Building Consent in order to carry out the work required by the notice.
(c) Give a copy of the notice to those people and bodies identified in s.155(2) Building Act 2004; and
(d) Notify potentially affected communities downstream of the dam, and Civil Defence and Emergency Management agencies.

Notices served on dam owners will:

- specify the work that needs to be carried out;
- the time in which it is to be completed; and
- whether the owner of the dam is required to obtain building consent in order to carry out the specified work.

When setting a timeframe for action, Nelson City Council will consider the nature of the issue, the classification of the dam and the priorities established in section 2.14 of this policy.

At the end of the time in which the remedial work is to be completed, Nelson City Council will inspect the dam.

2.7.5 Dam-break analysis

A dam-break analysis may be required. If requested by Nelson City Council this will be provided by the owner at the owner's expense within the time frame defined by the Council in the request.

2.7.6 Liaise with Civil Defence and Emergency Management

The Council will liaise with Civil Defence and Emergency Management directly if necessary.

2.7.7 Regional Authority to carry out work

Nelson City Council will carry out the work required in a Notice issued under Section 154 itself or via contractors if any work required under the Notice is not completed within the time frame given in the Notice.

All costs which Nelson City Council incurs will be recovered from the owner of the dam (section156 of the Building Act).

2.7.8 Situations when Notices will not be given

Where it is considered measures are necessary to avoid immediate danger Section 157 gives power to the Council to take swift action to remove immediate danger without first serving Notice on owners.

Without limiting this section, Nelson City Council will make reasonable effort to contact the dam owner(s) prior to taking action.

2.7.9 Dispute by owner of classification

Should an owner dispute the classification, an application for a 'Determination' pursuant to Section 176 of the Building Act may be made to the Chief Executive of the Department of Building and Housing as set out in the Building Act 2004. The determination of the Chief Executive is binding on the Council.

2.8 Guiding principles for dealing with dam owners

Before exercising its powers under sections 154 to 159 of the Building Act, Nelson City Council will seek to discuss options for action with owners, with a view to obtaining from the owner a mutually acceptable formal proposal for strengthening or replacement or removal of the dangerous dam.

In the event that discussions do not yield a mutually acceptable proposal, Nelson City Council will serve a formal Notice as outlined above under Section 2.7 of this policy.

Upon notice being served, Nelson City Council will expect the dam owner to pursue voluntary compliance with any notice that has been served. However, Nelson City Council will pursue legal outcomes if required as it has statutory obligations to take all practical measures to ensure public safety and well-being.

2.9 Remedial action requiring consent(s)

When building / resource consent(s) are necessary for remedial action required in a Notice served by Nelson City Council, the Council will process the required consent(s) in an appropriate timely manner.

2.10 Recording the status of a dam

Nelson City Council will keep a register of all dangerous dams, noting the status of requirements for improvement or the results of improvement, as applicable. In addition, the following information will be placed on file for each dangerous dam:

- the address and legal description of the dam and the land which supports it;
- whether the dam has a heritage listing;
- a statement that the dam is considered to be dangerous;
- the date by which any strengthening or demolition is required; and
- identification of any downstream area at risk.

This information will be kept as part of the property or site file.

The proposed Regulations contain an option for the Council to charge for maintaining this record. When the Regulations are finalised the Council will consider this option as part of its annual fees and charges review.

2.11 Availability of information

Information concerning the status of a dam will be contained in the property or site file and GIS system. If a notice under section 154 is issued in respect of any dangerous dam then a record of that will also be available on the relevant property file and dangerous dam database.

In granting access to information concerning these dams, the Council will conform to the requirements of the relevant legislation.

2.12 Economic impact of this policy

No specific analysis for the city of the economic impact of this legislative requirement has been carried out.

An accurate analysis can only be made after the dams have been evaluated to identify the nature and the extent of any strengthening work.

Without overriding the paramount aim of protecting public safety, when deciding what actions must be taken in respect of a dangerous dams Nelson City Council will take into account economic impacts that may arise from those actions.

2.13 Approach for dams and associated buildings having heritage status

Under Section 161 of the Building Act 2004 this policy must state how the policy will apply to heritage dams. For the purposes of this policy, a heritage dam (including associated structures) includes all dams listed as a heritage resource in the Nelson Resource Management Plan and/or those registered by the New Zealand Historic Places Trust (NZHPT). Section 4(2)(l) of the Building Act recognises the "need to facilitate the preservation of buildings of significant cultural, historical, or heritage value" .

Nelson City Council recognises the need to retain heritage fabric, but also the need to decommission, strengthen or demolish dams to mitigate the risk of loss of life in the event of a collapse. When considering heritage dams under this policy, account will be taken of the need to facilitate the preservation of dams with significant cultural, historical, or heritage value.

When dealing with dangerous heritage dams, Nelson City Council will seek advice from the NZHPT before it undertakes any action under sections 153–160 of the Act. Nelson City Council may engage the skills of suitably qualified professionals with heritage expertise to advise and recommend actions. Copies of all served notices will be provided to the NZHPT.

Nelson City Council will record the heritage listing of all dangerous dams it is made aware of in its dangerous dams register and on the relevant LIM.

2.14 Priorities

Under Section 161 of the Act, this policy must contain the Council's priorities in performing its functions in relation to dangerous dams.

Nelson City Council will prioritise the requirement to strengthen or demolish dangerous dams as follows:

First priority:	to ensure public safety at all times
Second priority:	economic welfare
Third priority:	heritage values

Appendix 1

FIGURE 5: NZSOLD CONSEQUENCE RATINGS WITH VERY LOW AND LOW PIC COMBINED		
Classification (PIC)	**Potential incremental consequences of failure**	
	Life	**Socioeconomic, financial and environmental**
High	Fatalities	Catastrophic damage
Medium	A few fatalities are possible	Major damage
Low	No fatalities are expected	Moderate damage or minimal damage beyond the dam owner's property

FIGURE 6: INCREMENTAL CONSEQUENCES FOR PIC CATEGORIES FOR USE IN DAM CLASSIFICATION REGULATIONS				
Population at risk (PAR)	**Severity of damage and loss**			
	Minimal	**Moderate**	**Major**	**Catastrophic**
0	Low	Low	Medium	High
1-10	Low (see notes 1 and 3 below)	Low (see notes 3 and 4 below)	Medium (see note 4 below)	High
11-100	(see note 1 below)	Medium (see notes 2 and 4 below)	High	High
More than 100		(see note 2 below)	High	High

The shaded area indicates the classification of PIC that should be chosen.

Note 1: With a PAR of five or more people, it is unlikely that the severity of damage and loss will be 'minimal'.

Note 2: 'Moderate' damage and loss would be unlikely where the PAR exceeds 100.

Note 3: Change to 'medium' PIC where the potential for one identifiable life being lost is recognised or where the loss of itinerant lives is reasonably likely.

Note 4: Change to 'high' PIC where it is reasonably likely two or more non-itinerant lives will be lost.

FIGURE 7: INCREMENTAL DAMAGE DESCRIPTORS ASSOCIATED WITH FIGURE 4 FOR USE IN DAM CLASSIFICATION REGULATIONS				
Descriptor	**Residential**	**Costs: socioeconomic and financial**	**Environment**	**Recovery time**
Catastrophic	More than 50 houses destroyed	Greater than $10 million	Permanent widespread ecological damage	Many years
Major	4-49 houses destroyed and a number of houses damaged	$1-10 million	Heavy ecological damage and costly restoration	Years
Moderate	1-3 houses damaged	$100,000-$1 million	Significant but recoverable ecological damage	Months
Minimal	No damage	Less than $100,000	Short-term damage	Days to weeks

Extract from the Department of Building and Housing's "Regulations for the Dam Safety Scheme: Discussion Document", May 2006.