MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

# COVERSHEET

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| **Minister** | Hon Poto Williams | **Portfolio** | Building and Construction |
| **Title of Cabinet paper** | Dam Safety Regulations: Policy Proposals | **Date to be published** | 13 April 2021 |

| **List of documents that have been proactively released** | | |
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| **Date** | **Title** | **Author** |
| 18 February 2021 | Dam Safety Regulations: Policy Proposals | Office of Hon Poto Williams |
| 24 February 2021 | Dam Safety Regulations: Policy Proposals – Minute of Decision DEV-21-MIN-0008 | Cabinet Office |
| 14 July 2020 | Impact Summary: Regulatory Framework for Dam Safety | Ministry of Business, Innovation and Employment |

**Information redacted** **NO**

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**In Confidence**

Office of the Minister for Building and Construction

Cabinet Economic Development Committee

# Dam Safety Regulations: Policy Proposals

## Proposal

1 This paper seeks agreement to the design of post-construction dam safety regulations, to give effect to the dam safety provisions of the *Building Act 2004*.

2 This paper also seeks agreement to amend the provisions of the *Building Act 2004* that deal with the requirements for annual dam compliance certificates and the offences and penalties for failures to meet those requirements.

## Executive summary

3 New Zealand does not have an operative dam safety framework[1], contrasting with almost all other OECD countries. The absence of an operative post-construction dam safety regulatory framework means that the risks posed by dams are poorly managed. This exposes people, property and the environment to unnecessary risk.

4 Cabinet agreed to the release of a public discussion paper on proposed dam safety regulations in May 2019 [DEV-19-MIN 0118 refers]. The consultation period ended on 6 August 2019 with 106 submissions received.

5 Stakeholders were largely supportive of the proposals made in the public discussion document. However, they raised a number of specific concerns, including the threshold for a dam's inclusion in the regulatory system and the availability of appropriately skilled engineers. The policy proposals have been revised to reflect stakeholder feedback.

6 Dams are classed as buildings for the purposes of the *Building Act 2004* (Building Act). The Building Act has a stated purpose to ensure that people who use buildings can do so safely and without endangering their health. The principles of the Building Act also state that a building should be built and used in a way that does not damage other property and that a building should be durable for its intended use.

7 The Building Act also contains requirements for dam owners relating to post-construction dam safety. Regulations are required to identify:

- which dams are included in the regulatory framework (what constitutes a classifiable dam);
- how to assess the potential impact of a dam failure (Potential Impact Classification);
- the required contents of a Dam Safety Assurance Programme;

[1] Some local or regional authorities include dam safety provisions in resource consents, but this is not consistent practice and is not a requirement under the *Resource Management Act 1991*.

- the competency requirements for a recognised engineer; and
- the criteria for determining when a dam is flood-prone, earthquake-prone or dangerous.

**Background – dam safety in New Zealand**

8 The best available data shows that New Zealand has around 3,300 known dams[2]. Since 1960 there have been 25 known dam incidents in New Zealand, with at least 14 being considered serious. There have been no recorded fatalities to date. Recent incidents include the flood resulting from the Makirikiri Dam (Whanganui) failure in 2013, and severe silting of the Waiau River in 2015 after the Waihi Dam's sluice gates were damaged.

9 The Building Act contains provisions for regulating post-construction dam safety. However, regulations are needed to give effect to those provisions.

**Policy proposals relating to dam safety regulatory framework elements**

10 Cabinet agreed to the release of a public discussion paper on proposed dam safety regulations in May 2019 [DEV-19-MIN 0118 refers]. The consultation period ended on 6 August 2019 with 106 submissions received.

11 Stakeholders were largely supportive of the proposals made in the public discussion document. However, they raised a number of specific concerns. Key issues raised included the threshold for a dam's inclusion in the regulatory system and the availability of appropriately skilled engineers. The policy proposals have been revised to reflect stakeholder feedback.

12 I seek Cabinet's agreement to policy proposals, which respond to the submissions received. The technical elements of the proposals have been tested with the Ministry of Business, Innovation and Employment's (MBIE) Dam Safety Technical Working Group.

13 The proposed regulatory framework for dam safety is risk-based: it has been designed to balance the strength of the regulatory requirements with the level of hazard presented by the dam. Dams that present little or no hazard will only face light regulatory requirements.

14 The regulatory framework for dam safety set out in the Building Act has four steps:

- determine whether the dam meets the size requirements for inclusion in the regulatory system (classifiable dam);
- determine the level of hazard that a classifiable dam presents to people, property and the environment (Potential Impact Classification);
- if the dam has a medium or high Potential Impact Classification, develop a Dam Safety Assurance Programme; and
- review the Potential Impact Classification and the Dam Safety Assurance Programme at regular intervals.

[2] New Zealand Inventory of Dams, the Quake Centre, University of Canterbury, 2018.

15 The regulatory elements are further described in Table 1 below with a summary of revisions made in response to submissions received.

**Table 1: Required regulatory elements – response to submissions**

| Regulatory feature | Description | Response to submissions |
|---|---|---|
| Classifiable dam definition | The size threshold that will determine whether a dam is included within the regulatory framework. The proposed definition is described in paragraph 17. | Submitters provided considerable feedback on this threshold. MBIE revised the threshold to ensure that smaller low risk structures such as stock drinking ponds and weirs are not captured. |
| Potential Impact Classification | A risk assessment which all classifiable dams must receive. Dams will receive a Potential Impact Classification rating of low, medium or high. Detail about the proposed Potential Impact Classification assessment is included in Annex 1. | Cultural and social factors have been added to the Potential Impact Classification assessment in response to feedback received from submitters. |
| Dam Safety Assurance Programme | All medium or high Potential Impact Classification dams must have a Dam Safety Assurance Programme, which is a plan for the safe operation of the dam. The detailed requirements for a Dam Safety Assurance Programme can be found in Annex 2. | Submitters agreed with the Dam Safety Assurance Programme proposals in the discussion document. As such, the proposals have not been changed following consultation. |
| Flood-prone, earthquake-prone and dangerous dams | Criteria for identification of flood-prone, earthquake-prone and dangerous dams need to be included in the regulations. These criteria will give regional authorities[3] powers to impose requirements on the owners of these dams. The criteria can be found in Annex 3. | Submitters largely supported the proposed criteria. As such, the proposals have not been changed following consultation. |
| Competencies for recognised engineers | Recognised engineers will be responsible for certifying Potential Impact Classifications and Dam Safety Assurance Programmes. The competencies for recognised engineers must be specified in the regulations. The proposed competencies are in Annex 4. | Submitters provided considerable feedback on the competencies for recognised engineers. MBIE revised the competencies to focus on the regulatory functions performed by recognised engineers. |

*Defining a classifiable dam*

16 The Building Act states that dam owners are required to determine whether their dam meets the classifiable dam threshold.

[3] The term ‘regional authorities’ is used in the Building Act 2004, rather than ‘regional councils’. The former term has been used in this paper.

17 I propose to define, by regulation, what constitutes a classifiable dam by specifying height and volume thresholds for a dam's inclusion in the regulatory framework. Dams that meet any one of the defined thresholds below will be required to undergo a potential impact assessment and will receive a Potential Impact Classification.

| | |
|---|---|
| a | 4 metres minimum dam height and a minimum of 20,000 cubic metres of stored water; OR |
| b | 1 metre minimum dam height and a minimum of 40,000 cubic metres of stored water; AND |

Further, with relation to stored water:

| | |
|---|---|
| i | Stored water that is lower than natural ground level at the downstream (or outside) toe of the dam or canal structure at its maximum height shall not form part of the volume calculation; AND |
| ii | Stored water that is lower than the canal invert (at the location of hypothetical canal breach) shall not form part of the volume calculation. |

18 The classification thresholds were developed in consultation with stakeholders by MBIE's technical advisors, who have prior industry experience and can provide qualified expertise on the engineering and safety requirements of varying types of dam infrastructure. The thresholds are consistent with methodologies used in other countries, and aim to strike a balance between capturing dams that may present a hazard to people, property and the environment, and not imposing a regulatory burden on the owners of small dams that are not hazardous, such as stock drinking ponds and weirs in rural areas.

19 MBIE will develop a dam safety guidance document for dam owners, practitioners and regulators. This will include guidance on how to calculate the height and volume of a dam.

20 Under the Building Act, where a dam owner believes that they own a classifiable dam, they must notify their regional authority of its size and location. Regional authorities must also keep a register of all classifiable dams in their region. These registers will improve New Zealand's information about its dam stock.

21 The Ministry for Primary Industries raised concerns about the assessment costs for low-risk agricultural and irrigation dams. I have considered this, but do not agree with further exemptions to the threshold criteria currently proposed. A small number of agricultural dams are sufficiently large and close to population centres or to key infrastructure that they present a hazard. It is therefore desirable that these dams are captured by the regulatory system. Most agricultural dams will continue to face little or no regulatory requirements.

*Assessing dam risk through Potential Impact Classifications*

22 The Building Act states that dam owners are required to classify their dams according to the potential impact of their failure. The Potential Impact Classification assessment will consider the impact that a hypothetical failure of the dam would have on people, property and the environment.

23 I propose to set out in regulations the procedure for undertaking Potential Impact Classification assessments as described in Annex 1. This will see dams assessed as

low, medium or high Potential Impact Classification, based on the way in which failure would be expected to impact the community, cultural sites, critical or major infrastructure, the natural environment and community recovery time.

24 Iwi and community submitters commented that the understanding of risk reflected in a Potential Impact Classification should include sites of cultural importance and risks to vulnerable populations. The presence of schools, pre-schools, hospitals, aged care facilities and locations of cultural and/or historic significance will be included in the factors that must be considered in determining a dam's Potential Impact Classification.

25 In addition to the regulations themselves, MBIE will develop a guide that assists owners of dams with undertaking a Potential Impact Classification assessment.

*Managing dam risk through Dam Safety Assurance Programme*

26 The Building Act requires medium or high Potential Impact Classification dams to have in place a Dam Safety Assurance Programme. The purpose of a Dam Safety Assurance Programme is to ensure that a dam that presents a hazard to people, property or the environment is operated in a way that minimises risk. The proposed requirements for the Dam Safety Assurance Programme are intended to ensure that the owner of the dam has the management systems and surveillance systems in place to monitor the safety of their dam.

27 I propose to define by regulation the Dam Safety Assurance Programme requirements detailed in Annex 2. These requirements include procedures for the operation, maintenance, and surveillance of dams. Where possible, the Dam Safety Assurance Programme requirements will be prescribed as flexibly as possible to reflect the needs of large dam owners, such as hydroelectric generators, who may already hold scheme wide dam safety management systems that apply to multiple dams.

28 The proposed assurance requirements draw on elements of the existing New Zealand Dam Safety Guidelines (2015) published by the New Zealand Society of Large Dams (NZSOLD). NZSOLD is a technical group of Engineering New Zealand. The Guidelines represent industry good practice in dam safety management, and are already followed on a voluntary basis by many large commercial dam owners.

29 Some farmers and irrigators raised concerns about the need to prepare a Dam Safety Assurance Programme for their dams. However, it is unlikely that many of them will need to do so as the proposed height and volume thresholds already exclude smaller, low risk structures such as stock drinking ponds and weirs from the regulations. The majority of farm dams, even if they are large enough to be classifiable, will likely be assessed as low Potential Impact Classification due to being located far from populated areas.

30 Low-Potential impact classification dams will not require a Dam Safety Assurance Programme. Risk ratings for Potential Impact Classifications will be assessed on a case-by-case basis and will include:

- the extent to which it presents a hazard to people, property or the environment downstream of the dam, and consideration will be given to:

- the number of people likely to be affected by inundation; and
- determination of assessed damage level including to schools, hospitals, aged care facilities and locations of high cultural and/or historic significance.

31 In light of these considerations, most agricultural dams that present little or no hazard will face light or no regulatory requirements.

*Defining 'moderate earthquake', 'moderate flood', 'earthquake threshold event', and 'flood threshold event'*

32 The Building Act requires regional authorities to have a policy on earthquake-prone, flood-prone, and dangerous dams. The Building Act also enables regional authorities to require owners to review the Dam Safety Assurance Programme for earthquake-prone or flood-prone dams. Definitions of 'moderate earthquake', 'moderate flood', 'earthquake threshold event', and 'flood threshold event' are needed to help regional authorities adopt their policies.

33 A recognised engineer engaged to provide a certificate for a Potential Impact Classification, Dam Safety Assurance Programme or dam compliance certificate, must notify the regional authority and the owner of the dam if they believe that the dam is dangerous as defined by the Building Act. The regional authority can then direct work to be done to reduce or remove the danger.

34 Where the owner fails to undertake repairs as directed, a regional authority may apply to the District Court for an order permitting it to undertake the repairs or demolition at the owner's cost.

35 I propose to define by regulation the definitions of 'moderate earthquake', 'moderate flood', 'earthquake threshold event', and 'flood threshold event' to give effect to those terms described in Annex 3.

36 The definitions are derived from New Zealand Structural Design Standard 1170 and will be used largely by engineers. They are technical in nature and are supported by the dam engineering professional community. They are intended to provide a threshold for intervention by regional authorities, not a best practice design standard.

*Defining the required competencies of recognised engineers*

37 Recognised engineers have a key role in the dam safety regulatory framework. The Potential Impact Classification and Dam Safety Assurance Programme must be certified by a recognised engineer. The Building Act specifies that a recognised engineer must be registered under the *Chartered Professional Engineers of New Zealand Act 2002* and have such additional qualifications and competencies as specified in the regulations.

38 I propose to set out by regulation the required competencies for recognised engineers as specified in Annex 4. I do not propose to specify qualifications at this stage as the Building Act already specifies further qualifications.

39 I have proposed a set of competencies clustered into two different scopes of practice: those required to certify a Potential Impact Classification and those required

to certify a Dam Safety Assurance Programme. These are related, but distinct, sets of competencies.

40 Engineering New Zealand will develop a training and assessment programme for these competencies. There will be an opportunity for recognised engineers to specialise in the certification of Potential Impact Classifications or the certification of Dam Safety Assurance Programmes.

41 Engineering New Zealand has informed me that only a small number of engineers currently have all of the required competencies to be a dam safety recognised engineer. However, it expects to be able to put a training programme in place and to grow capacity fairly quickly to meet demand.

**Policy proposals relating to dam safety provisions in the Building Act 2004**

42 A dam compliance certificate confirms to regional authorities that a dam owner has complied with all the requirements of their Dam Safety Assurance Programme for the 12 months prior to its issue. A recognised engineer must sign off the certificate, recording any minor issues noted during their assessment. Once supplied, the certificate provides regional authorities with a safety record for the dam in between the periodic reviews of Dam Safety Assurance Programmes required under the Building Act.

43 Under section 150(3) of the Building Act, dam owners with Dam Safety Assurance Programmes must publicly display a copy of their annual dam compliance certificate in a prominent place on the dam.

44 The Building (Building Products and Methods, Modular Components, and Other Matters) Amendment Bill will increase the maximum financial penalties for non-compliance associated with the requirement to display the certificates on dams, as part of a broad amendment of penalties in the Building Act to better reflect the seriousness of the offences.

45 Stakeholder feedback received following public consultation on dam safety highlighted that the requirement to publicly display a copy of their annual dam compliance certificate on the dam is impractical, due to most dams being on private land and not accessible by the public.

46 In response to stakeholder feedback, I propose to remove the requirement to publicly display dam compliance certificates on dams, and remove the corresponding offences and penalties for non-compliance.

47 I propose to create offences which will instead enforce the remaining requirement to supply dam compliance certificates to Regional Authorities.

48 I propose to apply penalty levels which meet criteria previously agreed by Cabinet for offences under the Building Act that currently have a maximum financial penalty of $5,000 and which reflect the nature and seriousness of the offending.

49 The Ministry of Justice's Offence and Penalty Vetting team are satisfied that the proposed offences and penalties are consistent with Legislation Design and Advisory Committee guidelines.

50 I propose that these changes are made through the next available suitable legislative vehicle such as a regulatory systems amendment bill. Regulatory systems amendment bills aim to maintain the effectiveness and efficiency of regulatory systems. The proposed amendments are set out in the table below.

**Table 2: amended offences and penalties for dam safety scheme**

| Current section 150 offences and current maximum penalty amounts | Proposed section 150 offences and proposed maximum penalty amounts | Summary of proposed changes |
|---|---|---|
| Section 150(1) An owner of a dam for which a Dam Safety Assurance Programme has been approved, or is deemed to have been approved, must supply to the regional authority a dam compliance certificate in accordance with subsection (2) | None | Retain requirement |
| Section 150(3) The owner must publicly display a copy of the dam compliance certificate in a prominent place on the dam | Remove requirement | Remove requirement |
| Section 150(4) and 150(5) A person commits an offence if the person knowingly- | | Remove section 150(4) offences and section 150(5) penalties which relate to section 150(3) requirement |
| Fails to display a dam compliance certificate that is required to be displayed under this section with a maximum fine of $5,000 for a person<br><br>Displays a dam compliance certificate otherwise than in accordance with this section with a maximum fine of $5,000 for a person | A person commits an offence if the person fails to supply a dam compliance certificate to the Regional Authority as required under the Building Act with a maximum fine of $20,000 for an individual and $60,000 for other persons | Create new strict liability offence penalising:<br>**failing to supply certificate to Regional Authority**<br>Instead of:<br>**failing to publicly display certificate on dam**<br>and instead of<br>**knowingly displaying a dam compliance certificate otherwise than in accordance with this section** |
| Displays a false or misleading dam compliance certificate with a maximum fine of $5,000 for a person | A person commits an offence if the person knowingly supplies a false or misleading dam compliance certificate with a maximum fine of $50,000 for an individual and $150,000 for other persons | Create new offence penalising:<br>**knowingly supplying** a false or misleading certificate<br>Instead of:<br>**knowingly displaying** a false or misleading certificate<br><br>Applies the proposed maximum penalty amounts for offences of medium seriousness consulted on |

| | | |
|---|---|---|
| | | under the Building Products and Methods, Modular Components, and Other Matters) Amendment Bill |

## Compliance issues

*Forms*

51 I propose that Cabinet agree the content of the forms specified within Annex 5 be the content of forms specified in the regulations, in order to enable regional authorities to document and enforce compliance.

52 The proposed forms detailed in Annex 5 include:

52.1 Dam classification certificates;

52.2 Dam Safety Assurance Programmes; and

52.3 Dam compliance certificates.

*Building and resource consents*

53 Some regional authorities currently regulate dam safety through resource consent conditions imposed under the Resource Management Act 1991 (RMA). Typically, these resource consent conditions require the dam owner to follow the New Zealand Dam Safety Guidelines developed by NZSOLD.

54 The introduction of dam safety regulations will mean that regional authorities should no longer attempt to regulate the structural safety of dams using conditions in resource consents. Several regional authorities have informed MBIE that they intend to review dam safety resource consent conditions when the regulations are implemented. Owners of dams may also apply for a review of their resource consent conditions by their regional authority.

55 MBIE will consult with regional authorities and with the Ministry for the Environment to support effective implementation of the regulations. Where appropriate, MBIE will provide advice to regional authorities and to the owners of dams in order to effectively review resource consent conditions.

## Implementation

56 I propose a two year implementation timeframe between gazetting and the regulations coming into force. This will address concerns raised by submitters that they would need sufficient time to prepare for their new obligations, and secure a suitably qualified engineer. It will allow Engineering New Zealand time to train the recognised engineers needed for implementation of the regulations and meet any increase in demand. Two years will also allow time for Crown agencies to carry out an inventory of their dam stock on Crown land.

## Financial implications

57 The proposed regulations are based on the New Zealand Dam Safety Guidelines. Many (mainly large commercial) dam owners voluntarily follow these guidelines as

best practice; other dam owners are required to follow elements of the guidelines as conditions of their resource consents.

58 Dam owners who follow the guidelines already have dam safety management systems in place for their dams, and these dam owners will face lower costs to comply with the regulations. The proposed regulations are minimum dam safety standards only and dam owners will still be able to manage their dams in excess of these standards if they wish.

59 The regulations will have the greatest financial impact on the owners of poorly managed dams that present a risk to people, property or the environment. It cannot be determined with certainty how many dams are in this category, but a cost benefit analysis has determined that the potential benefits of regulating these dams (which are the costs of a dam break that has been avoided) far outweigh the compliance costs of regulating them. The benefits relative to costs are fully outlined in the attached Regulatory Impact Statement.

60 The Crown is an owner of dams through the Department of Conservation (DoC) and the Waka Kotahi NZ Transport Agency. These agencies do not follow the voluntary New Zealand Dam Safety Guidelines and will face compliance costs to implement the proposed regulatory framework. Waka Kotahi NZ Transport Agency has estimated their one-off set up costs as being in a range of $0.5 million to $1.0 million.

61 DoC owns a number of dams on conservation land. It is estimated that 25 of these may be large enough to be captured by the proposed regulatory framework; however, it is likely that most of these 25 dams will face light regulatory requirements due to being in low risk locations. DoC has completed a stocktake of its dams and is aware of the numbers, locations and characteristics of these dams.

62 MBIE is aware of cases where dams that no longer fulfil a useful purpose have been decommissioned in the interests of public safety. The introduction of the regulations may encourage more dam owners to consider decommissioning some dams that no longer fulfil a useful purpose.

63 The proposed regulatory framework may result in some of DoC's dams needing to be repaired or decommissioned. Some of these dams are historic and are listed by Heritage New Zealand. DoC intends to work with Heritage New Zealand to decide how to better manage historic dams. It is likely that there will be associated asset management costs for the Crown. DoC estimates that the costs of the proposed Potential Impact Classifications for DoC's dams will be $250,000.

64 Local government owns a large number of dams. These have a variety of purposes, including water supply, sewage treatment and flood detention. A number of local government dam owners, such as Watercare Auckland, Wellington Water and Nelson City currently follow the voluntary Dam Safety Guidelines. These councils will not be strongly impacted by the proposed regulatory framework.

65 Watercare Auckland, a Council-controlled Organisation of Auckland Council, has expressed support for the proposed regulatory framework. However, a number of councils who are dam owners have expressed that they may face significant asset management costs if the regulations are implemented, particularly if they are not already following the voluntary guidelines.

66 The Department of Internal Affairs initially expressed concerns about compliance costs for councils. It has not been possible to determine what proportion of councils will be impacted and to what degree. As already described, the greatest costs will fall on councils that own poorly managed dams.

### Legislative implications

67 To give effect to the dam safety provisions under the Building Act, Cabinet's decision is required on the policy proposals for the dam safety regulations and the amendments to section 150 of the Building Act.

68 I propose that these amendments to the Building Act be made through the next available legislative vehicle, such as a regulatory systems amendment bill. Regulatory systems amendment bills aim to maintain the effectiveness and efficiency of regulatory systems.

## Impact analysis

### Regulatory Impact Statement

69 A Regulatory Impact Statement is attached to this Cabinet paper. MBIE's Regulatory Impact Analysis Review Panel has reviewed the attached Impact Statement prepared by MBIE. The Panel considers that the information and analysis summarised in the Impact Statement meets the criteria necessary for Ministers to make informed decisions on the proposals in this paper.

### Climate implications of policy assessment

70 The Ministry for the Environment's Climate Implications Policy Assessment team has been consulted on this Cabinet paper and has confirmed that the CIPA requirement does not apply.

### Population implications

71 Some members of vulnerable populations such as children, disabled people and the elderly may be at greater potential risk of harm following a dam failure because they are less mobile, or because they have other impairments or conditions that increase their susceptibility or limit their ability to respond in an emergency. The proposed regulatory framework will require dam owners to have regard to the presence of such populations when assessing the risk that their dams pose.

72 Iwi groups commented that dam failures have the potential to impact on sites of cultural or historic significance. The presence of such sites has been added to the factors that dam owners must consider when undertaking dam failure risk assessments.

### Human rights

73 This paper has no implications under the New Zealand Bill of Rights Act 1990 or the Human Rights Act 1993.

### Departmental consultation

74 The following agencies were consulted on this paper: Ministry for the Environment; Ministry for Primary Industries; Te Puni Kōkiri; Departments of Conservation and

Internal Affairs, the National Emergency Management Agency; Land Information New Zealand; Landcorp; Waka Kotahi NZ Transport Agency, the Treasury, and Ministry of Justice. The Ministry of Transport and KiwiRail were invited to provide comments. The views of agencies are captured in the body of the paper.

75 The Department of the Prime Minister and Cabinet were informed.

**Communications**

76 A summary of submissions report was published on the MBIE website in October 2019. Further communications materials will be developed as work on the regulations is progressed. MBIE will prepare a guidebook to support the regulations.

77 I intend to issue a media release announcing these decisions.

**Proactive release**

78 I propose to proactively release this Cabinet paper and associated Cabinet Minute within 30 business days. The Cabinet paper and Minute will be published on MBIE's website and any redactions will be based on Official Information Act 1982 principles.

**Targeted consultation**

79 I propose to consult the Technical Working Group on Dam Safety on an exposure draft of the regulations. The Technical Working Group on Dam Safety comprises representatives of Meridian Energy, the NZ Society of Large Dams, Irrigation New Zealand, Federated Farmers of New Zealand, Canterbury, Waikato and Otago regional councils, and the University of Canterbury Quake Centre. I propose to consult with Engineering New Zealand.

80 MBIE has employed a transparent and collaborative approach with the dam sector during the development of proposed regulatory framework criteria, and targeted consultation with the Technical Working Group and Engineering New Zealand on an exposure draft will ensure that the final regulations are technically correct.

**Recommendations**

The Minister for Building and Construction recommends that the Committee:

1 **note** that there are existing provisions in the *Building Act 2004* that would enable a post-construction dam safety scheme for New Zealand, but regulations are needed to give effect to these provisions;

2 **note** that Cabinet agreed to public consultation on new dam safety regulations in May 2019 [DEV-19-MIN 0118 refers];

3 **note** that feedback received during public consultation was generally supportive of the proposed regulatory framework, although a number of specific concerns were raised, these have been addressed in the current proposals;

*Classifiable dam definitions*

4 **note** that the proposed classifiable dam definition has been changed from the one that was consulted on to address the concerns of submitters about inadvertent inclusion of ponds, irrigation races and weirs in the proposed regulatory framework;

5 **agree** to the following classification thresholds for classifiable dams:

| | |
|---|---|
| a | 4 metres minimum dam height and a minimum of 20,000 cubic metres of stored water; OR |
| b | 1 metre minimum dam height and a minimum of 40,000 cubic metres of stored water; AND |

Further, with relation to stored water:

| | |
|---|---|
| i | Stored water that is lower than natural ground level at the downstream (or outside) toe of the dam or canal structure at its maximum height shall not form part of the volume calculation; AND |
| ii | Stored water that is lower than the canal invert (at the location of hypothetical canal breach) shall not form part of the volume calculation. |

*Potential Impact Classifications*

6 **note** that the Potential Impact Classification will inform the basis for the requirements of the Dam Safety Assurance Programme;

7 **agree** to the criteria and standards for the Potential Impact Classification methodology specified in Annex 1;

*Dam Safety Assurance Programme*

8 **agree** that the criteria and standards for a Dam Safety Assurance Programme shall be as specified in Annex 2;

*Defining 'moderate earthquake', 'moderate flood', 'earthquake threshold event', and 'flood threshold event'*

9 **agree** to definitions of 'moderate earthquake', 'moderate flood', 'earthquake threshold event' and 'flood threshold event' that give effect to the proposals in Annex 3;

*Recognised engineer competencies*

10 **agree** to the competencies for recognised engineers as specified in Annex 4;

*Amendments to section 150 of the Building Act 2004 relating to dam compliance certificates*

11 **note** that feedback received following public consultation on the proposed regulations highlighted that the requirement to publicly display a copy of the annual dam compliance certificate on the dam is impractical, due to most dams being on private land and not accessible to public;

12 **agree** to amend the Building Act 2004 to remove the requirement to publicly display dam compliance certificates on dams, and remove the corresponding offences and penalties for non-compliance (as outlined in paragraph 50);

13 **agree** to amend the Building Act 2004 to create an offence where a person fails to supply a dam compliance certificate to the Regional Authority as required under the Building Act 2004, with a maximum fine of $20,000 for an individual and $60,000 for other persons (as outlined in paragraph 50);

14 **agree** to amend the Building Act 2004 to create an offence where a person knowingly supplies a false or misleading dam compliance certificate with a maximum fine of $50,000 for an individual and $150,000 for other persons (as outlined in paragraph 50);

*Forms*

15 **agree** that the content specified in Annex 5 be the content of the prescribed forms used to document compliance with the regulations;

*Timing of implementation*

16 **agree** that the period between the gazetting of the regulations and their coming into force should be two years, with the precise implementation date to be determined as regulations are being drafted;

*Next steps*

17 **authorise** the Minister for Building and Construction to issue drafting instructions to Parliamentary Counsel to give effect to the policy proposals in this paper;

18 **agree** that the amendments to the offences in the Building Act 2004 be made through the through the next available legislative vehicle, which may be a regulatory systems amendment bill;

19 **authorise** the Minister for Building and Construction to consult nominated members of the Technical Working Group on Dam Safety and Engineering New Zealand on an exposure draft of the regulations;

20 **authorise** the Minister for Building and Construction to make decisions, consistent with the proposals in these recommendations on any issues which arise during the drafting process; and minor, technical and timing changes to these proposals as required;

21 **note** that the Minister for Building and Construction intends to issue a press release announcing these decisions; and

*Proactive release*

22 **note** that this paper and the associated Cabinet Minute will be released under Government's proactive release policy.

Authorised for lodgement

Hon Poto Williams

Minister for Building and Construction

## Annex 1

I propose that Cabinet agree to the prescribed criteria and standards for the Potential Impact Classification methodology detailed below.

### Potential Impact Classification requirements

Under the Potential Impact Classification requirements, all dams that meet the height and volume thresholds for 'classifiable dam' must be classified according to the impact of a hypothetical failure of the dam on people, property and the environment.

This assessment must be certified by a recognised engineer who states that the classification of the dam meets the prescribed criteria and standards for dam safety. The following steps are required:

- Identify the effect that an uncontrolled release of the reservoir would have, due to a failure of the dam when full, on each of the specified categories as shown in Table 1.
- Using Table 1, determine the assessed damage level by assessing whether the damage level in each of the specified categories is catastrophic, major, moderate or minimal. The impact classification must be based on the category with the highest damage level.
- Estimate the population at risk as shown in Table 2**.**
- Use Table 2 to determine the dam classification by correlating the assessed damage level with the population at risk, being the number of people likely to be affected by inundation.

A dam must be classified as having a low, medium or high Potential Impact Classification. The Potential Impact Classification forms the basis for the requirements of the Dam Safety Assurance Programme. A dam's Potential Impact Classification is critical information for owners of dams and for dam regulators, as it forms the basis for ongoing operational safety and maintenance requirements.

The material in Table 1 and Table 2 is based on the *New Zealand Dam Safety Guidelines* (2015)*,* but differs in some respects. The Guidelines provide information to engineers, dam owners and others involved in maintaining and administering dam safety.

## Table 1: Determination of assessed damage level

| Damage Level | Specified categories | | | | | |
|---|---|---|---|---|---|---|
| | Community | Cultural | Critical or major infrastructure | | Natural environment | Community recovery time |
| | | | Damage | Time to restore to operation | | |
| Catastrophic (one or more may apply) | More than 50 houses destroyed<br>Destruction of a school, pre-school, hospital or rest home | Destruction of one or more sites of major (national) historical or cultural significance | Extensive and widespread destruction of and damage to several major infrastructure components | More than one year | Extensive and widespread damage | Many years |
| Major (one or more may apply) | Four to 49 houses destroyed<br>Serious damage to a school, pre-school, hospital or rest home | Major damage to one or more sites of local or regional historical or cultural significance | Extensive destruction of and damage to more than one major infrastructure component | Up to 12 months | Heavy damage and costly restoration | Years |
| Moderate (one or more may apply) | One to three houses destroyed, and some damaged<br>Moderate damage to a school, pre-school, hospital or rest home | Damage to a historic or cultural site of importance to a local community | Significant damage to at least one major infrastructure component | Up to three months | Significant but recoverable damage | Months |
| Minimal | Minor damage | Minor damage | Minor damage to major infrastructure components | Up to one week | Short-term damage | Days to weeks |

## Table 2: Determination of Potential Impact Classification

| Assessed damage level | Population at risk (the number of people likely to be affected by inundation) | | | |
|---|---|---|---|---|
| | 0 | 1 to 10 | 11 to 100 | More than 100 |
| Catastrophic | High potential impact | High | High | High |
| Major | Medium potential impact | Medium/High (see note 4) | High | High |
| Moderate | Low potential impact | Low/Medium/High (see notes 3, and 4) | Medium/High (see note 4) | Medium/High (see notes 2 and 4) |
| Minimal | Low potential impact | Low/Medium/High (see notes 1, 3, and 4) | Low/Medium/High (see notes 1, 3, and 4) | Low/Medium/High (see notes 1, 3, and 4) |

**Notes:**

1. With the population at risk at five or more people, it is unlikely that the potential impact will be Low.
2. With the population at risk at more than 100 people, it is unlikely that the potential impact will be Medium.
3. Use a Medium classification if it is highly likely that a life will be lost.
4. Use a High classification if it is highly likely that 2 or more lives will be lost.

## Annex 2

I propose that Cabinet agree to the requirements for a Dam Safety Assurance Programme and the contents of the programme specified below.

### Requirements for a Dam Safety Assurance Programme

The Building Act 2004 requires all dams with a medium and high Potential Impact Classification to have a Dam Safety Assurance Programme. The prescribed criteria and standards for content of a Dam Safety Assurance Programme need to be specified in the regulations. The requirement to have a Dam Safety Assurance Programme will compel owners of dams to plan for and commit to the safe operation of their dam, and provide processes for the overall management of dam safety.

A Dam Safety Assurance Programme must be audited and certified by a recognised engineer. An annual audit of compliance with the Dam Safety Assurance Programme must be signed off by a recognised engineer and the owner must supply this to regional authorities in the form of the annual dam compliance certificate.

### Contents of a Dam Safety Assurance Programme

Each Dam Safety Assurance Programme will be required to include the components shown in Table 1.

A Dam Safety Assurance Programme must be consistent with the following principles:

1. The consequences of a dam failure should be understood so that appropriate management actions can be applied to protect people, property and the environment.
2. All natural hazards, loading conditions, potential failure modes and any other threats to the safe operation and rehabilitation of a dam should be identified.
3. Dams and appurtenant structures should be operated and rehabilitated in a manner which ensures they meet appropriate performance criteria.
4. The responsibility for the safety of the dam rests with the dam owner.
5. A dam safety management system, commensurate with the consequences of dam failure and incorporating policies, procedures and responsibilities, should be in place for all dams.
6. All reasonable efforts should be made to prevent and mitigate accidental releases, dam safety incidences, and dam failures.
7. Effective emergency preparedness and response procedures should be in place for dams.
8. Due diligence should be exercised during all stages of a dam’s life cycle.

## Table 1: Content of a Dam Safety Assurance Programme

| **Elements of a Dam Safety Assurance Programme** |
|---|
| The Dam Safety Assurance Programme must contain procedures for the following elements:<br>1. dam and reservoir operation and maintenance;<br>2. surveillance;<br>3. appurtenant structures and gate and valve systems;<br>4. intermediate dam safety reviews;<br>5. comprehensive dam safety reviews;<br>6. emergency preparedness; and<br>7. identifying and managing dam safety issues. |
| *1. Dam and reservoir operation and maintenance:*<br>• procedures and protocols for dam and reservoir operation;<br>• operator experience and training;<br>• reservoir operation records; and<br>• dam and reservoir maintenance. |
| *2. Surveillance:*<br>• documented surveillance processes and procedures;<br>• quality assurance;<br>• visual inspections;<br>• performance monitoring instrumentation;<br>• monitoring data management;<br>• dam performance evaluation; and<br>• escalation and reporting of issues. |
| *3. Appurtenant structures and gate and valve systems:*<br>• identify appurtenant structures and gate and valve systems with dam and reservoir safety functions;<br>• inspection and maintenance of appurtenant structures;<br>• inspection, maintenance and testing of gate and valve systems; and<br>• inspection, maintenance and testing of other dam and reservoir safety systems. |
| *4. Intermediate dam safety reviews:*<br>• on-site inspection of the dam and appurtenant structures;<br>• review of operation, surveillance, maintenance and testing records;<br>• evaluation of the performance of the dam as indicated by on-site inspection and operation, surveillance, maintenance and testing records; and<br>• A report that identifies any dam safety issues, any changes to monitoring or visual inspection frequencies, or any additional items to be monitored. |
| *5. Comprehensive dam safety reviews:*<br>• review of all relevant information including data books, reports and surveillance records;<br>• review of known and potential hazards and dam safety threats;<br>• detailed on-site inspection of the dam and appurtenant structures; |

| |
|---|
| • site inspection and witnessing of testing of gates and valves that fulfil dam and reservoir safety functions;<br>• assessment of the adequacy of the dam and its appurtenant structures;<br>• review of the organisation of operational resources and infrastructure;<br>• review of emergency preparedness including procedures, training, exercises, facilities and equipment; and<br>• completion of a report on the above. |
| *6. Emergency preparedness*<br>• development of an emergency action plan;<br>• integration with territorial, regional and emergency authorities;<br>• emergency equipment and resources; and<br>• exercise and review of emergency action plan. |
| *7. Identifying and managing dam safety issues*<br>• identification and categorisation of the following dam safety issues:<br>o physical infrastructure issues;<br>o potential dam safety deficiencies;<br>o confirmed dam safety deficiencies; and<br>o non-conformances;<br>• dam safety issue recording, prioritising and tracking; and<br>• dam safety deficiency investigation, assessment and resolution. |

## Annex 3

I propose that Cabinet agree to definitions of ‘moderate earthquake’, ‘moderate flood’, ‘earthquake threshold event’, and ‘flood threshold event’ that give effect to those presented below.

### Earthquake-prone, flood-prone and dangerous dams definitions

| | |
|---|---|
| **Moderate earthquake** | An earthquake that would generate shaking at the site of the dam that would occur with a 1 in 50 annual exceedance probability (determined by normal measures of acceleration, velocity, and displacement) but not less than shaking determined using a z factor of 0.13. |
| **Moderate flood** | A flood of water or other fluid flowing into the reservoir that has a 1 in 50 annual exceedance probability. |
| **Earthquake threshold event** | • For a high potential impact dam, an earthquake that would generate shaking at the site of the dam with a 1 in 500 annual exceedance probability (determined by normal measures of acceleration, velocity and displacement) but not less than shaking determined using a z factor of 0.13.<br>• For a medium potential impact dam, an earthquake that would generate shaking at the site of the dam with a 1 in 250 annual exceedance probability (determined by normal measures of acceleration, velocity and displacement) but not less than shaking determined using a z factor of 0.13. |
| **Flood threshold event** | • For a high potential impact dam, a flood of water or other fluid flowing into the reservoir that has a 1 in 500 annual exceedance probability<br>• For a medium potential impact dam, a flood of water or other fluid flowing into the reservoir that has a 1 in 250 annual exceedance probability. |

## Annex 4

I propose that Cabinet agree to the competencies for recognised engineers specified below.

The engineering competencies are directly linked to the regulatory role that is being performed. Recognised engineers will only be required to demonstrate competencies that relate directly to auditing and certification of dam safety management systems. A programme for training and assessing these skills will be developed by Engineering New Zealand.

### Recognised engineer required competencies

| **Potential Impact Classifications** |
|---|
| Certification of dam Potential Impact Classifications, including an understanding of the underpinning principles of:<br>• the dam classification system;<br>• dam break flood hazard assessment; and<br>• consequence assessment. |
| **Dam Safety Assurance Programmes** |
| Audit, certification and review of Dam Safety Assurance Programme, including:<br>• dam and reservoir operation and maintenance;<br>• surveillance;<br>• appurtenant structures and gate and valve systems;<br>• intermediate dam safety reviews;<br>• comprehensive dam safety reviews;<br>• emergency preparedness; and<br>• identifying and managing dam safety issues. |

## Annex 5

I propose that Cabinet agree that the content specified below be the content of forms used to document compliance.

### Forms

### Dam Classification Certificate

The following information is proposed to be included in the dam classification certificate:

- information about the dam. This will include: the dam name, the location of the dam, date of construction, any applicable building consent or resource consent reference, purpose of the dam, type of dam, height of the dam, maximum reservoir volume (in cubic metres), description of spillway or flood control facility, flood capacity, changes in design or operation since construction, relevant regional authority;
- the dam's Potential Impact Classification;
- name of the owner of the dam, name of the operator of the dam (if different from the owner), appropriate contact person and contact details;
- a certificate from a recognised engineer certifying that the classification of the dam accords with the criteria and standards for classifying a dam as low, medium or high;
- evidence that the engineer is a Recognised Engineer; and
- the Recognised Engineer's signature, name and Chartered Professional Engineer registration Number (or any future statutory equivalent).

### Dam Safety Assurance Programme

The proposed information to be included in a Dam Safety Assurance Programme form is:

- reference to the dam's Potential Impact Classification certificate and where it can be found, including any applicable regional authority reference;
- the dam's Potential Impact Classification;
- name of the owner of the dam, name of the operator of the dam (if different from the owner), appropriate contact person with respect to the Dam Safety Assurance Programme and contact details;
- a brief description and summary (to be attached to the form) of how each of the dam safety elements have been adequately addressed for the dam, and indicating where these are addressed in the Dam Safety Assurance Programme;
- a list of all supporting documentation, manuals and publications referred to in the Dam Safety Assurance Programme and the location of this material;
- the documents and procedures that form the Dam Safety Assurance Programme are attached;
- a statement on the location of the Dam Safety Assurance Programme;
- a statement on the appropriate contact person and contact details with respect to the Dam Safety Assurance Programme;
- a certificate from the Recognised Engineer that the Dam Safety Assurance Programme meets the prescribed criteria and standards for the Dam Safety Assurance Programme;
- evidence attached that the engineer is a Recognised Engineer; and

- the recognised engineer's signature, name and Chartered Professional Engineer registration number (or any future statutory equivalent).

**The Annual Dam Compliance Certificate**

The annual dam compliance certificate will state that, except for identified, minor items of non-compliance, all procedures of the Dam Safety Assurance Programme have been complied with over the previous twelve months.

The proposed information to be included in an annual dam compliance certificate is:

- reference to the dam's Potential Impact Classification certificate and where it can be found, including any applicable regional authority reference;
- date of approval of Dam Safety Assurance Programme, expiry date of approved Dam Safety Assurance Programme;
- the dam's Potential Impact Classification;
- name of the owner, name of the operator (if different) and appropriate contact person and contact details;
- a compliance statement which states that except for identified, minor items of non-compliance, all procedures in the Dam Safety Assurance Programme have been fully complied with during the previous 12 months; and
- a certificate from a Recognised Engineer that they have reviewed the owner's reports and other documents relating to the procedures in the Dam Safety Assurance Programme that the owner has followed in the previous 12 months, and except for identified, minor items of non-compliance, that all procedures in the Dam Safety Assurance Programme have been complied with during the previous 12 months.

This evidence is attached to the Recognised Engineer's certificate, which includes:

- The Recognised Engineer's signature, name and Chartered Professional Engineer registration Number (or any future statutory equivalent).