



Dam Failure Consequence Classification Conversion Guideline For Dams in British Columbia (BC Reg. 163/2011, November 30, 2011)

Background to Dam Classification in BC

In 1999 the Canadian Dam Association (CDA) published Dam Safety Guidelines to establish safety requirements for new and existing dams, enable the consistent evaluation of dam safety deficiencies and to provide a basis for dam safety legislation and regulation. The Guidelines included a 4-tier failure consequence classification system: very low, low, high and very high. In February 2000, the BC Dam Safety Regulation (44/2000), under the *Water Act* of BC, was enacted. Schedule 1 of the Regulation defined 4 dam classifications similar to those provided by the CDA. In 2007, the [CDA](#) Guidelines were rewritten and the consequence classification system changed to 5 tiers: low, significant, high, very high and extreme. The Province has recently amended the BC Dam Safety Regulation bringing the provincial consequence classification system in-line with the CDA Guidelines.

2011 BC Dam Safety Regulation Amendment

On November 30, 2011, the BC Dam Safety Regulation was amended. Schedule 1 of the amended Regulation includes a 5-tier dam failure consequence classification (Attachment 1). This change aligns the consequence classification of BC dams with the current CDA Guidelines thus ensuring BC's dam safety requirements are consistent with the current CDA Guidelines.

Conversion to the New 2011 Dam Failure Consequences Classifications

The dam failure consequence classifications for all dams in BC have been converted to the new 5-tier classifications as per Schedule 1 of the BC Regulation 163/2011 (Attachment 1). The conversions are based on the Dam Consequence Conversion Table provided in Attachment 2. Dam owners are being advised of the Regulation change and provided with confirmation of their dam failure consequence classification by registered letter during August and September 2011. Many dam owners have undertaken dam break inundation studies to confirm the consequence classification or to provide evidence for a revised classification. If a dam owner does not receive notice of their new dam classification by October 2011, or if you have additional information that might influence the dam failure consequence classification, please contact your local [Dam Safety Officer](#).

Additional Information

It is important to note that the BC Dam Safety Regulation dam failure consequence classification determines the requirements that a **dam owner** must meet. The CDA Guidelines classifications are for **dam design** criteria. Please refer to the [CDA website](http://www.cda.ca/) to order the CDA Guidelines (<http://www.cda.ca/>).

Please note that under the amended BC Dam Safety Regulation (163/2011), there are some additional dam safety requirements for dam owners based on the consequence classifications. For example, owners of Significant Consequence Classification dams (formally Low Consequence Classification dams, BC Reg. 44/2000) are now required to prepare [Emergency Preparedness Plans](#). Also, effective November 30, 2011, all owners of dams located on Crown land, except those dams classified as Low Consequence, are required to post signs at their dams. For further information please refer to the [Dam Signage Requirement](#) Information Sheet and [OIC 237/2011](#) available on the BC Dam Safety website.

BC Dam Safety Website: http://www.env.gov.bc.ca/wsd/public_safety/dam_safety/index.html

Attachments:

Attachment 1 –BC Dam Safety Regulation (163/2011), Schedule 1. November 30, 2011.

Attachment 2 – BC Dam Consequence Classification Conversion Table. March 27, 2012.

Schedule 1 – Dam Safety Regulation (163/2011), November 30, 2011¹

Downstream Dam Failure Consequences Classification Table

Dam failure consequences classification	Population at risk	Consequences of failure		
		Loss of life	Environment and cultural values	Infrastructure and economics
Low	None ²	There is no possibility of loss of life other than through unforeseeable misadventure.	Minimal short-term loss or deterioration and no long-term loss or deterioration of (a) fisheries habitat or wildlife habitat, (b) rare or endangered species, or (c) unique landscapes or sites of cultural significance.	Minimal economic losses mostly limited to the dam owner's property, with virtually no pre-existing potential for development within the dam inundation zone.
Significant	Temporary only ³	Low potential for multiple loss of life.	No significant loss or deterioration of (a) important fisheries habitat or important wildlife habitat, (b) rare or endangered species, or (c) unique landscapes or sites of cultural significance, and restoration or compensation in kind is highly possible.	Low economic losses affecting limited infrastructure and residential buildings, public transportation or services or commercial facilities, or some destruction of or damage to locations used occasionally and irregularly for temporary purposes.
High	Permanent ⁴	10 or fewer	Significant loss or deterioration of (a) important fisheries habitat or important wildlife habitat, (b) rare or endangered species, or (c) unique landscapes or sites of cultural significance, and restoration or compensation in kind is highly possible.	High economic losses affecting infrastructure, public transportation or services or commercial facilities, or some destruction of or some severe damage to scattered residential buildings.
Very high	Permanent ⁴	100 or fewer	Significant loss or deterioration of (a) critical fisheries habitat or critical wildlife habitat, (b) rare or endangered species, or (c) unique landscapes or sites of cultural significance, and restoration or compensation in kind is possible but impractical.	Very high economic losses affecting important infrastructure, public transportation or services or commercial facilities, or some destruction of or some severe damage to residential areas.
Extreme	Permanent ⁴	More than 100	Major loss or deterioration of (a) critical fisheries habitat or critical wildlife habitat, (b) rare or endangered species, or (c) unique landscapes or sites of cultural significance, and restoration or compensation in kind is impossible.	Extremely high economic losses affecting critical infrastructure, public transportation or services or commercial facilities, or some destruction of or some severe damage to residential areas.

¹ This table is a copy of Schedule 1 of the Dam Safety Regulation 163/2011. In case of discrepancy between this table and the approved Regulation, the Regulation takes precedence.

² There is no identifiable population at risk.

³ People are only occasionally and irregularly in the dam-breach inundation zone, for example stopping temporarily, passing through on transportation routes or participating in recreational activities.

⁴ The population at risk is ordinarily or regularly located in the dam-breach inundation zone, whether to live, work or recreate.

BC Dam Failure Consequences Classification Conversion Table (March 27, 2012)¹

Consequence Classification NEW BC Dam Safety Regulation 163/2011	Population at Risk	Loss of Life		Environment and Cultural Values ²		Infrastructure & Economics ²		Consequence Classification OLD BC Dam Safety Regulation 44/2000
	BC Reg. 163/2011 Only	BC Reg. 163/2011	BC Reg. 44/2000 ⁽³⁾	BC Reg. 163/2011	BC Reg. 44/2000	BC Reg 163/2011	BC Reg. 44/2000	
Low	None	No possibility of loss of life	Minimal	Minimal short-term and no long-term loss or deterioration	No significant loss of habitat or sites	Minimal economic losses mostly limited to dam owner's property	< \$100K Minimal	Very Low
Significant	Temporary Only	Low potential for multiple loss of life ⁶	Some Possible	No significant loss or deterioration incl. Important habitat Restoration or compensation possible	Loss or deterioration of regionally important habitat & sites – High chance for restoration or compensation	Low economic losses to buildings, services, public transportation, infrastructure, etc.	< \$1M Limited Infrastructure, Public, Commercial	Low
High	Permanent Residents	< 10	< 10 ⁽⁴⁾	Significant loss or deterioration incl. Important habitat Restoration or compensation possible	Same as below	High economic losses to buildings, services, public transportation, commerce, infrastructure, etc.	< \$10M ⁽⁴⁾ Same as below	High (Low⁴)
Very High	Permanent Residents	< 100	< 100	Significant loss or deterioration incl. critical habitat Restoration or compensation impractical	Loss or deterioration of Nationally & Provincially important habitat & sites – High chance for restoration or compensation	Very high economic losses to important buildings, services, transportation, infrastructure, commerce etc. Or severe damage to residential areas	< \$100M Substantial Infrastructure, Public, Commercial	High (High⁴)
Extreme	Permanent Residents	>100	>100	Major loss or deterioration incl. critical habitat Restoration or compensation impossible	Loss or deterioration of Nationally & Provincially important habitat & sites – Low chance for restoration or compensation	Extremely high economic losses to critical buildings, services, transportation, infrastructure, commerce etc. Or destruction or severe damage to residential areas	>\$100M Very High Infrastructure, Public, Commercial, Residential	Very High

¹ This table contains abridged descriptions of the dam failure consequences. Attachment 1 contains the full descriptions from BC Regulation 163/2011. In all cases the Regulation takes precedence over information contained in this table.

² Names for these categories in BC Reg. 44/2000 are “Environmental and Cultural Losses” and “Economic and Social Losses” respectively.

³ Conservative estimate of loss of life amongst population affected by the flood waters (may equal Population at Risk).

⁴ Sub-classifications of “High (Low)” and “High (High)” and associated thresholds were established by policy in 1998 for use in the BC Dam Safety Program risk-based assessment.

⁵ A temporary population (e.g. in recreational areas) could be quite large and a “sunny-day” failure could result in multiple fatalities.