

GUIDELINES FOR DAM SAFETY EMERGENCY PLANS

November 2018

Version 3.0

**Water Operations Branch
Department of Primary Industries, Parks, Water & Environment**



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1. Introduction

These *Guidelines for Dam Safety Emergency Plans November 2018* (“the Guidelines”) replace the previous *Guidelines for Dam Safety Emergency Management Plan July 2013*.

A Dam Safety Emergency Plan (the Plan) is a required activity under the *Water Management (Safety of Dams) Regulations 2015* (the Regulations) for:

- dams with a Consequence category of High C or above where there is the potential for loss of life in the event of dam failure;
- or,
- tailings dams with a Consequence category of Significant or above where there is potential for loss of life in the event of dam failure, or where infrastructure or environmental values could be at risk should the dam collapse or fail.

The Regulations also specify the competence class of a person undertaking the development of a Plan.

The Guidelines have been developed to assist dam engineers and emergency management consultants when developing Plans. The purpose of these Guidelines are to detail the key aspects that must be included when developing a Plan.

The Guidelines have been developed in accordance with the Australian National Committee on Large Dams (ANCOLD) *Guidelines on Dam Safety Management August 2003*.

Due to Tasmania’s unique circumstances such as its legislative requirements for dam safety and emergency management, geographical and geological settings -it has been necessary to develop these Guidelines over and above what is contained within the above ANCOLD Guidelines.

ANCOLD "Guidelines on Dam Safety Management" August 2003 state the following:

Dam Safety Emergency Plans should exist for all dams where there is the potential for loss of life in the event of dam failure.

A Dam Safety Emergency Plan (DSEP) is a formal plan that:

- *Identifies emergency conditions which could endanger the integrity of the dam and which require immediate action;*
- *Prescribes procedures which should be followed by the dam owner and operating personnel to respond to, and mitigate, these emergency conditions at the dam; and*
- *Provides timely warning to appropriate emergency management agencies for their implementation of protection measures for downstream communities.*

2. Dam Safety Emergencies

When dealing with emergency responses, Tasmania Police are the lead organisation and will manage an emergency situation. The Commissioner of Tasmania Police is the State Emergency Management Controller and adopts the State Special Emergency Management Plan (Dam Safety Emergencies).

The dam owner is responsible in triggering the Dam Safety Emergency Plan, assisted by Tasmanian Police and the Department of Primary Industries, Parks, Water and Environment (“the Department” or “Dam Safety Regulator”).

In the implementation of levee emergencies, the procedures are to be in accordance with the State Special Emergency Management Plan (Floods). The State Emergency Services (SES) assumes control in a flood incident where a levee has failed to hold back water or has been overtopped.

3. Guideline Requirements

3.1 Competence Class

In developing a Plan, the Regulations specify the competence class required by a person undertaking this activity.

Table 1 and 2 provide the competence class, as required in the Regulations for water storage dams and tailings dams.

Table 1 – Competence class required for dam safety emergency plans for dams

Consequence Category						
Very Low	Low	Significant	High C	High B	High A	Extreme
No specific class required	No specific class required	Class 1	Class 1	Expert team	Expert team	Expert team

Table 2 – Competence class required for dam safety emergency plans for tailings dams

Consequence Category						
Very Low	Low	Significant	High C	High B	High A	Extreme
No specific class required	No specific class required	Class 1 or Class 3	Class 1 or Class 3	Class 1 or Class 3	Class 1 or Class 3	Class 1 or Class 3

3.2 Plan Acceptance

The Guidelines provide the minimum requirements when developing a Plan. A submitted Plan that does not address or provide the basic requirements of the Guidelines will not be accepted and will be referred back to the dam owner.

3.3 Compliance

The dam owner is required to submit the completed Plan to the Department of Primary Industries, Parks, Water and Environment (the Department).

The Plan must be provided in electronic format as a PDF file and must include a flood zone inundation map in digital spatial format, as an ESRI shapefile (preferable) or MapInfo TAB.

The dam owner is responsible for implementing the Plan in a dam safety emergency situation.

The dam owner is responsible for ensuring the Plan is easily accessible to staff or family members and the emergency procedures explained to them. It is suggested that a trial emergency situation is enacted.

3.4 Plan Assessment fee

When the Plan is assessed by the Department, a fee in accordance with the Regulations will be charged for the time spent in assessing the Plan. A minimal fee of \$94.80 (FY2018/19) for each half hour assessing the Plan will be charged. A cost of \$210.00 (FY2018/19) is also charged to upload the Plan onto the Emergency Services GIS LIST database.

4. Preparation of a Dam Safety Emergency Plan

4.1 Plan Proforma for individual dams

The Plan proforma ***Dam Safety Emergency Plan Proforma*** is the preferred Plan format to be used. The proforma highlights the key areas that must be addressed, including an emergency procedure flowchart showing how emergency procedures will be implemented. For an electronic version see dpiwwe.tas.gov.au/water/dams/dam-safety.

4.2 Content of a Plan

The following information is to be included as a minimum in the Plan.

General Dam Information

- Dam name, location, Dam ID Number, Dam Owner/ Manager name, Consequence category, dam failure risk/s, directions to dam.
- A “Controlled Document Security Notice”.
- Date, copy number, Plan Holder Name.

Dam Specifications (in a tabular form)

- General information (dam location Easting and Northing, water resource, year of construction, Consequence Category, operator etc).
- Embankment details (type, crest level, crest length, crest width, height, upstream slope and downstream slope).
- Reservoir details (full supply level, capacity at FSL, surface area at FSL, catchment area, instream or off stream).
- Spillway details (type, crest level, minimum embankment level adjacent to spillway, top of spillway sidewalls, crest width and capacity).
- Outlet details (pipe type, class or head, nominal diameter, method of joining -fusion welded or Victaulic joints).

Contact List for Emergency Response

- Contact details of those persons and organisation to be contacted in an emergency:
 - dam owner or manager
 - Tasmania Police
 - DPIWWE Dam Safety Regulator
 - consulting engineer and
 - dam contractor.
- Details of all Plan Holders associated with document number

Note: Due to the fact that the Plan will most likely need to be triggered in an emergency situation, it should contain all essential details, but should be kept as succinct as possible.

Identified Flood Zone Risk Map

- The Identified Flood Zone Risk Map must detail identified dwelling/s and other significant features like roads, bridges etc that are likely to be directly affected by the dam failure flood. Where there are multiples of these features downstream of a dam at risk, a comprehensive flood assessment will need to be undertaken as described in the ANCOLD guidelines “Guidelines on the Consequence Category for Dams” 2012. This will need to be undertaken as part of the consequence category assessment that is to be contained within the comprehensive surveillance report.
- The area downstream will need to be accurately surveyed as set out in the ANCOLD 2012 Consequence Category Guidelines and the flood impact model will need to be undertaken for a range of dam failure scenarios using computer programs that consider at least one dimensional unsteady open channel flow such as HEC-RAS (Hydrologic Engineering Center-River Analysis System).
- The ANCOLD 2012 guidelines has the following suggested distances downstream of a dam breach and should be mapped.

Storage (ML)	Intervals Between Sections (Total Distance)
Greater than 2,000	1 kilometre (up to 60 kilometres)
200 to 2,000	0.5 to 1 kilometre (up to 20 kilometres)
Up to 200	Not greater than 0.5 kilometre (up to 5 kilometres)

- Using aerial photographic imagery with contours, map everything downstream of a dam including all roads and dwellings, places where people may congregate (parks) and features of significance such as wetland and railway lines.
- Usually it is only roads and dwellings that are present. This should be undertaken until a major river system, lake or sea that would absorb a flood from an upstream dam breach is encountered and as discussed above, due to topographic influences, this is rarely further than 5km within flood wave.
- Travel times, depth and velocities must be included at each potential Population at Risk and Potential Loss of Life impact location in the Identified Flood Zone Risk Map.

Flood Zone Inundation Map

- This must show the worst case scenario for flooding as per the flood zone risk map but does not need to include infrastructure details that is likely to be affected by a flood from a breach of a dam, as Emergency Management GIS use this inundation map to overlay their latest up-to-date details on downstream infrastructure when determining the location of more vulnerable members of the public.
- Flood Zone Inundation Maps to be included in the Plan, using GDA94 datum.
- **IMPORTANT:** The flood zone inundation map must be supplied in a compatible electronic format that allows it to be stored suitably on the Emergency Services GIS LIST database as an ESRI shapefile (preferable) or MapInfo TAB.

Emergency Information

- Priority notification process and procedure.
- Emergency evacuation procedures - meeting point and access routes.
- List of emergency equipment and materials required.

Dam Owner and Consulting Engineer Declarations

- The Plan must be signed by the dam owner and/or operator indicating that they have read and understood its requirements and will undertake any such actions necessary to implement the Plan.
- The Plan must be signed and dated by the consulting engineer who prepared the Plan.

4.3 Controlled Document

The Plan should be confidential and only be provided to members within the distribution list.

The Plan is to be made a 'Controlled Document' and all holders of the Plan need to be made aware of the security nature of the Plan.

The Plan is to be read and understood by all authorised holders and is to be used and followed in the situation of a dam safety emergency.

5. Plan Compliance

The dam owner is required to submit the completed Plan to the Department.

It is recommended that emergency contact numbers be updated at least annually.

The Plan is to be revised and updated usually at the same time the Comprehensive Surveillance Report is undertaken, and in conjunction with the revised consequence category assessment. If circumstances below the dam change within the review period, such as a development of a residential area, then the Plan will need to be revised and updated accordingly.

The dam owner is responsible for implementing the Plan in a dam safety emergency situation.

The dam owner is responsible for ensuring the Plan is easily accessible and the emergency procedures explained to staff or family members.

Further Information

Dam Safety Coordinator

Water Operations Branch

Department of Primary Industries, Parks, Water and Environment

PO Box 46, Kings Meadows TAS 7249

Visit dpipwe.tas.gov.au/water/dams/dam-safety or

Call (03) 6777 2236 for assistance or

Email damsafety@dpipwe.tas.gov.au

Links The *Water Management (Safety of Dams) Regulations 2015* and the *Water Management Act 1999* are available at <http://www.thelaw.tas.gov.au/>

ANCOLD Publications

ANCOLD publications referred to in the Guidelines are available from

<http://www.ancold.org.au/>

Submissions

All DSEPs must be provided as an electronic copy in PDF file format and submitted to damsafety@dpipwe.tas.gov.au

The flood zone inundation map must be supplied in a compatible electronic format (flood polygon) as an ESRI shapefile (preferable) or MapInfo TAB file.