Private dam maintenance and management in emergencies

There are more than 30 000 privately owned dams in South Australia. Some of these dams would pose a significant safety threat to downstream communities if they were to fail. Private dam owners often overlook their responsibility to maintain their dams, increasing the risks to downstream communities. Guidelines aimed at providing dam owners and emergency responders with more information about preventing and responding to such hazards have been recently developed for public use.

Background

The Department for Environment and Water (DEW) in its role as flood hazard leader, has developed guidelines together with the South Australian State Emergency Services (SES) to assist dam owners and emergency responders better prevent and respond to potential dam safety incidents. This document provides a brief overview of the content in the guidelines.

A 'dam safety incident' is defined as a situation where a sudden uncontrolled release or excessive controlled release of water from a dam happens or threatens to happen. The release may be caused by damage to or failure of the dam structure, flood conditions unrelated to failure, or any condition that may affect the safe operation of the dam. The release of water may or may not endanger human life, downstream property, or the operation of the structure.

Owners of large public dams have emergency action plans. Owners of private dams should still have planning in place to know what to do.

The SES is the control agency for flood in South Australia and have the responsibility for responding to flood emergencies and ensuring the public is adequately informed and warned. The SES is a key contact in the case of a dam safety incident.

Objectives

The objectives of the guideline are to assist dam owners and emergency responders to:

- better understand dams and the risk they pose;
- better understand surveillance and maintenance requirements of dams;
- better understand their responsibilities and liability;
- be better prepared in the event of an emergency such as extreme rainfall which could trigger dam safety incidents;
- be able to recognise signs indicating potential dam failure, plus how and why this may be happening;
- know what to do when an issue arises, including what mitigation actions may be taken;
- know who to contact, and which tasks they can assist with;
- know when to seek professional advice.

Figure 1: Overtopping of dam at full capacity (prior to failure)

Content of the Guidelines

The Guideline will assist owners and emergency responders in recognising the signs and causes of a dam safety incident, assessing the risk, and effectively communicating with others regarding the incident.

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The Guideline:

- contains common terminology to assist with communicating with emergency services, engineers and other qualified professionals;
- provides advice on ongoing maintenance and surveillance for dam owners to assist in preventing dam safety incidents;
- describes the hazard posed by dam failure, including common risk factors and how to estimate the potential extent of dam break inundation;
- contains information for dam owners and emergency responders on types of dam failures, their cause and common warning signs;
- provides a Rapid Risk Assessment tool for both dam owners and emergency services to assist in determining whether further action is needed if it is suspected that a dam safety incident may occur;
- provides guidance to both dam owners and emergency services on actions they should take during a dam safety incident, including remedial works for dams which may prevent or reduce the impact of failure.

This guideline is not intended to provide design advice for dam repair or upgrade works. Advice should be sought from a suitably qualified and experienced professional. Some works may require a water affecting activity permit or development approval. Contact the local Natural Resources Centre or Local Council in your area if you need more information on approvals and permits.

Quick tips

It is vital that dam owners undertake regular inspections (surveillance) of their dam. The benefits of regular surveillance and maintenance are:

- it enables the identification of minor defects which can be repaired cost effectively before major damage occurs
- it prolongs the life of the dam and protects against deterioration
- it ensures that the dam owner is familiar with the conditions of the dam so that any changes can be noticed more easily, for example, whether a seepage condition is worsening or represents the normal condition of the dam.

Examples of dam maintenance actions are:

- removing and mowing vegetation; establishing desirable vegetation cover
- replacing deteriorated riprap and erosion protection
- restoring settled crest and freeboard
- repairing seepage-induced slumping
- cleaning the spillway and outlets, including pipes and low flow devices
- controlling surface erosion
- controlling burrowing animals.

What to do during a dam safety incident:

- inform the SES at the earliest opportunity so that appropriate emergency responses can be instigated. The SES may also be able to assist with action to mitigate dam failure, such as pumping and placement of sandbags
- immediately seek the advice of a suitably qualified and experienced professional
- do not do anything that will put you or anyone else at risk.

Figure 2: Overtopping dam failure

For more information

The guideline is available on the Department for Environment and Water's website:

https://www.environment.sa.gov.au/topics/water/hazard-management

Other sources of information:

Flood Awareness website:

https://www.waterconnect.sa.gov.au/Hazard-Management/Flood-Awareness

The SES website:

http://www.ses.sa.gov.au/

The SA,GOV.AU website:

https://www.sa.gov.au/topics/emergencies-and-safety/types/flood

The natural resources website:

http://www.naturalresources.sa.gov.au/home