

Improving flood, levee bank and dam management in South Australia

Submission

May 2019

Summary of recommendations

The following three key principles underpin the Local Government Association of South Australia (LGA) considerations in relation to improving flood, dam and levee bank management in South Australia:

- Water management is a shared responsibility between all spheres of government, the community and landholders;
- Successful water management requires ongoing financial support. Cost shifting or increased responsibility should not be placed on local government without commensurate ongoing financial and other support from the state government; and
- The information gathering, prioritisation and defining of responsibility in relation to existing issues with legacy structures is the responsibility of state government in consultation with local government and other stakeholders.

The LGA, in keeping with the above key principles, makes the following recommendations in relation to the Department for Environment and Water (DEW) draft position papers on flood, dam and levee bank management in South Australia;

1. The state government takes the leadership to integrate water management across South Australia by introducing cohesive and comprehensive water policies and regulations;
2. The decision making responsibility in relation to new dams and levee banks should be managed under single pieces of legislation:
 - 2.1. Dam design, risk considerations, compliance, regulation, dam construction applications and accompanying failure impact rating assessment are provided for under the new *Landscape South Australia Bill 2019* (SA); and
 - 2.2. Levee bank planning, design, maintenance and compliance requirements are provided for under the *Planning Development and Infrastructure Act 2016* (SA) with construction requirements provided for under the Building Code of Australia and the Victorian levee bank management guidelines utilised in the development of levee management plans.
3. Dams on private land should be maintained, to standard, by the private landowners;
4. Ongoing management and maintenance roles and responsibilities for levee banks whether on public and private land should be clearly understood by all levels of government, land owners and the community;
5. Any endeavour undertaken by the state government should not negatively impact commercial arrangements councils have undertaken in relation to water storage and re-use schemes;
6. General research, into the overall costs and benefits of dam and levee banks management to councils should be conducted to help establish best flood mitigation practice;
7. The Tasmanian Flood Mapping Project should be used as an example for South Australia of an integrated state-wide approach to water management and flood mitigation;
8. 'User friendly' flood mapping to be developed to assist in educating the public about flood risk;
9. A central data base should be established, with the database capturing information regarding location, size, depth and risk rating of structures as well as being used for the regulation of dams and levee banks where new risk considerations like impacts of other dam or levee banks on the structure, updates to existing structures, maintenance or rehabilitation works and records of any previous failures can be captured and monitored;
10. The central databases be made available to relevant state and local government authorities, emergency services, the Stormwater Management Authority, the new Landscape boards and on any title search or property search for current and prospective landowners; and
11. The state government consider undertaking a pilot project, to utilise existing information to help develop a flood and water risk matrix which identifies areas of focus to aid in the successful implementation of a state wide water management approach.

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About the Local Government Association

The LGA is a membership organisation representing all 68 councils in South Australia and is the voice of local government in South Australia. The LGA is recognised by the South Australian Parliament through the *Local Government Act 1999* (SA) and is a constituent member of the Australian Local Government Association.

The mission of the LGA is to provide leadership, support, representation and advocacy on behalf of South Australian councils, for the benefit of the community.

Local government's role in the flood, dams and levee banks management reform process

Local government acknowledges its responsibility to incorporate principles of good water management in considering federal and state government strategies¹ and as such welcomes this opportunity to provide a response to the Minister of the Department for Environment and Water (DEW) on the following three draft discussion papers;

- Improving Levee Bank Management in South Australia;²
- Improving Dam Management in South Australia;³ and
- Priorities for Improved Flood Management in South Australia.⁴

Local government undertakes activities to mitigate water and flood risk through business-as-usual practices,⁵ stormwater management and infrastructure planning and maintenance. Some councils have also undertaken commercial ventures involving water⁶ that provide environmental, social and economic benefits to the community.

As the level of government closest to the community, local government carries significant responsibility and risk associated with flood and water management, making local government contributions fundamental to the formulation of this reform.

In addition to this consultation, the LGA is currently advocating for the improvement of water and flood management practices in the state through providing policy guidance,⁷ reviewing the current stormwater⁸ and emergency management⁹ arrangements in South Australia and by contributing to the Flood Working Group.¹⁰

To develop this submission the LGA has consulted with councils, sought sector feedback and met with key DEW representatives.

¹ Local Government Association of South Australia, *Policy Manual*, ECM 664873, 4.3.3.

² Government of South Australia Department for Environment and Water, *Improving Levee Bank Management in South Australia Draft Position Paper for Consultation*, February 2019.

³ Government of South Australia Department for Environment and Water, *Improving Dam Management in South Australia Draft Position Paper for Consultation*, February 2019.

⁴ Government of South Australia Department for Environment and Water, *Priorities for Improving Flood Management in South Australia Draft Position Paper for Consultation*, February 2019.

⁵ Local Government Association of South Australia, *Local Government Emergency Management Framework Draft*, available for consultation until 17 May 2019 < <https://www.lga.sa.gov.au/page.aspx?c=84848> > page 19.

⁶ City of Salisbury, < http://www.salisbury.sa.gov.au/Live/Salisbury_Water >.

⁷ Local Government Association of South Australia, *Policy Manual*, ECM 664873, 5.2.2.

⁸ Local Government Association of South Australia, *Review of Stormwater Management legislation and Policy Discussion Paper*, January 2018, ECM 658270.

⁹ Above n 5.

¹⁰ Note: The LGA is a member of the Flood Working Group

Background

General note on flood and water management in South Australia

Flooding is the most costly natural disaster in South Australia.¹¹ It is a leading disaster risk¹² with the average annual cost of damages from flooding in the state exceeding 32 million dollars.¹³

Currently, the roles and responsibilities for dam and levee bank management in South Australia are fragmented between private land owners, local government and state government.

The LGA would note that this fragmentation of roles and responsibilities is reflected across the entirety of South Australia's water management practices and policies, including stormwater management and the emergency mitigation, response and recovery strategies for flooding.

The LGA views DEW's discussion papers on flood, dam and levee bank management as components of the state government's ongoing efforts to rectify the myriad of issues regarding flood and water management in the state.

The LGA recommends state government's leadership to create cohesion and consistency across all water and flood management practices. A holistic approach to flood and water management will involve undertaking comprehensive waterway and water catchment based considerations which involves an ongoing financial commitment and the integration of, for example, stormwater, dam and levee bank management.

The LGA notes the timeliness of this consultation on flood, dam and levee bank management with current state legislative reform¹⁴ taking place. This offers an opportunity for dam management, policy and practices and levee banks management, policy and practices to be clarified and streamlined under a new legislative approach. The *Landscape South Australia Bill*¹⁵ provides particular opportunity for Landscape Boards and Green Adelaide to increase their roles in regards to water and flood management.

Burns Review

The *Independent Review of the Extreme Weather Event South Australia 28 September – 5 October 2016*¹⁶ (Burns Review) was an independent review commissioned by the former Premier of South Australia following extreme weather experienced across the state in September 2016. This review assessed the emergency management response to the impacts caused by the extreme weather, the response to and management of the impacts of the state-wide power outage and the adequacy of the state's prevention, preparedness, and response and recovery arrangements.

This extreme weather event resulted in state-wide flooding, with dams threatening to, or bursting which increased water flow and flooding. Levee banks were overtopped, or lost their structural integrity, amplifying flood damage in areas they were designed to protect. The following recommendations were made in regards to flood, dam and levee bank management in South Australia;

1. Identify options for dam safety management, utilising Pisaniello and Tingey-Holyoak's discussion paper which identifies options to address dam safety to establish a business case for

¹¹ Gary Burns, Leanne Adams and Guy Buckley, *The Independent Review of the Extreme Weather Event South Australia 28 September – 5 October 2016*, page xiii.

¹² United Nations Office for Disaster Risk Reduction <https://www.unisdr.org/we/inform/terminology>

Note: Disaster Risk – the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.

¹³ Gary Burns, Leanne Adams and Guy Buckley, *The Independent Review of the Extreme Weather Event South Australia 28 September – 5 October 2016*, page xiii.

¹⁴ *Planning, Development and Infrastructure Act 2016* (SA); *Natural Resources Management Act 2004* (SA).

¹⁵ *Landscape South Australia Bill 2019* (SA).

¹⁶ Gary Burns, Leanne Adams and Guy Buckley.

cabinet¹⁷ and to develop, with appropriate agency involvement, protocols to identify and respond to the management of dams which are in danger of losing their structural integrity or spilling;¹⁸

2. Identify appropriate mechanisms for stakeholder agencies to share data, information and to develop plans and strategies for management of water levels in water catchments;¹⁹ and
3. That resources be provided to support the identification of responsibilities and the development of relevant policy in relation to levee bank management and flood mitigation.²⁰

DEW has placed emphasis on the recommendations from the Burns review throughout this reform.

The LGA supports the state government in addressing the issues identified in the Burns Review, however, the LGA believes that when considering water and flood management in South Australia additional important considerations exist that extend beyond recommendations contained in the Burns Review.²¹

Analysis of the proposed flood, dam and levee bank management reform

Cohesive Legislative approach

Water and flood related matters within South Australia are complex and require comprehensive engagement from a variety of cross-organisational stakeholders. Water management in the state involves a multifaceted network of legislative and regulatory requirements. The management of dam and levee banks are no exception to the cross organisational arrangements, however, there are currently no (or very little), comprehensive compliance or maintenance requirements for these structures. The lack of legislative and regulatory cohesion has resulted in a myriad of differing structural and management standards across the state.²²

South Australian local government have roles as regulators, providers of infrastructure, providers of goods and services, consumers of water, advocates for infrastructure and as environmental managers.²³ The lack of state regulatory oversight for dams and levee banks has resulted in mixed community expectations on what role local government plays in maintaining and regulating structures, particularly levee banks.

The LGA notes that not all councils in South Australia have the same experience, expertise or capacity when assessing flood, dam and levee bank planning and building applications and ongoing management. The roles assumed by councils varies greatly across the state depending on the councils location, financial capacity and the deemed necessity of undertaking certain kinds of water related works.

To achieve fundamental integration of water management in South Australia, legislative cohesion will enable state government to successfully coordinate across appropriate bodies. State government oversight enables an ongoing financial commitment that ensures community expectations are unified by providing the appropriate level of expertise and experience in siting, maintaining and regulating structures. State government oversight will also enable successful waterway and water catchment based coordination that transcends local government boundaries and limitations.

¹⁷ Burns Review, page xvii, Recommendation 18.

¹⁸ Ibid Recommendation 19.

¹⁹ Ibid Recommendation 20.

²⁰ Ibid page xviii, Recommendation 22.

²¹ Above n 16 recommendations are silent on Stormwater Management and the development of a state-wide flood hazard map.

²² Pisaniello, Tingey-Holyoak and Burritt, "Appropriate small dam management for minimizing catchment-wide safety threats: International benchmarked guidelines and demonstrative case studies", *Water Resources Research* (2012) 48, p 2, 8, 12.

²³ Jeff Tate Consulting, *Stormwater Narrative Report*, 2013, ECM 509073, page 8.

Dams

The LGA and DEW share the desired outcome that the;

“...roles and responsibilities for dam management are clearly articulated, agreed and understood by all relevant parties and are able to be implemented”²⁴

Additionally, the state government in the *Landscapes Directions*²⁵ advocates for the promotion of consistent approaches in regards to activities that affect water.²⁶

The Australian National Committee on Large Dams (ANCOLD) provide dam design guidelines²⁷ for large dams (10 - 15 meters high). For small dams, the construction is generally authorised under the *Natural Resources Management Act 2004 (SA)*²⁸ and requires a permit from the relevant *Natural Resources Management Board*.²⁹ If the proposed dam has a volume greater than 5 mega litres or a wall height greater than 3 meters than the dam requires approval under the *Development Act 1993*.³⁰ There are no design standards in the building code, nor in the South Australian Planning Policy Library for reference during the assessment of dam applications. Additionally, although there is a general duty placed on dam owners to maintain their dam, there is little awareness of this responsibility and there is no way to ensure dams on private property are being maintained.

The LGA recommends, for the following reasons expressed below, the new *Landscape South Australia Bill*³¹ (the Bill) provide for dam management including, but not limited to; design standards, risk and safety considerations, compliance and regulation.

The LGA is of the view that dams are best placed to be assessed under the Landscapes legislation as farm and irrigation dams are closely linked with water allocations and environmental considerations in respect to siting.

The LGA supports comprehensive and cohesive analysis of dam design being undertaken prior to development. The Bill could establish a requirement for relevant decision makers to have knowledge and experience in suitable dam design to ensure risk minimisation. Additionally, the bill could require dam design standards to be established and enforced across South Australia, to ensure cohesion. The LGA encourages the Minister to consult the ANCOLD dam design guidelines as they may be applicable for dams *“with the potential to cause loss of life or significant environmental or physical damage through operation or failure.”*³²

The Bill could also provide for a scale of competency to be developed depending on the size, nature and risk rating of the dam. For example dams greater than 3 metres could be provided for under certain guidelines; 3-10m require an engineer to evaluate; Greater than 10m require a full impact assessment or alternatively dams with a lower risk rating meet guidelines, mid-level risk rating require an engineer to evaluate and a high risk rating require a full impact assessment before development approval.

The LGA recommends that the Bill provide requirements similar to that of Queensland’s *Water Supply (Safety and Reliability) Act 2008*³³ that requires an application to construct a dam to be accompanied by a failure impact rating assessment so risk factors can be considered before development approval is issued. Additionally, a requirement for an approved flood mitigation manual³⁴ could be established to

²⁴ Above n 3, page 3.

²⁵ Government of South Australia, *Landscapes Directions – Landscape SA Bill*, 2019.

²⁶ Government of South Australia, *Landscapes Directions – Landscape SA Bill*, 2019, page 13.

²⁷ ANCOLD, *Dams Information*, < https://www.ancold.org.au/?page_id=334 >.

²⁸ s 127 (3) (d).

²⁹ *Natural Resources Management Act 2004 (SA)* s 126 (2) (b) (i).

³⁰ (SA) s 4.

³¹ 2019 (SA).

³² ANCOLD, *Dams Information*, < https://www.ancold.org.au/?page_id=334 >.

³³ *Chapter 4 – Referable dams and flood and drought mitigation*, ss 340 – 352.

³⁴ *Water Supply (Safety and Reliability Act 2008 (Qld)* s 371B.

reduce risks to the community and to assist emergency response in emergency situations. This information could also be factored into flood mapping to assist in keeping them up to date.

The Bill offers a point in time analysis, which enables decisions regarding dams to be reviewed and acted upon as new safety or risk considerations evolve. For example, an increase of development downstream from a dam could increase the risk to lives and property in the event of a dam break. Under the Bill, the minister or a water management authority, could require additional structural works³⁵ to be undertaken to reduce the risk or even order for the dam to be removed.³⁶ The Bill also requires dam owners to seek approval before undertaking works to enlarge a dam.³⁷

The LGA would like to note that the dam management discussion paper places particular emphasis on dam structural and safety considerations. Given the current state of Australia's climate and water scarcity, the community is (generally) more preoccupied with water use and allocation considerations.

Levee Banks

There is currently no unified database to identify levee bank location and the responsible body for maintenance. In general *"there is very little policy regarding management roles and responsibilities for levee banks."*³⁸ Like dams, the legislative and regulatory framework surrounding these structures is piecemeal and fragmented.³⁹

The LGA recommends unifying levee bank planning, design, maintenance and compliance requirements under the new elements of the *Planning, Development and Infrastructure Act 2016 (SA)*.⁴⁰

Levee banks are an important part of flood management infrastructure within South Australia and can be highly effective in containing flood waters however, without proper planning and management they can add to flood risk and hamper flood response and recovery.

A levee bank is generally built to protect assets that exist at the time, but the presence of a levee bank will usually encourage further development behind it.⁴¹ This form of infrastructure needs to be consulted during future planning and development considerations to ensure effective community disaster risk management⁴² can occur. Additionally, changing rainfall and extreme weather patterns from climate change need to be factored into all future water management planning.

A levee is an expensive structure that requires whole-life-cycle management.⁴³ If it is correctly constructed, managed and maintained many levees may have an indefinite lifespan and may eventually become fixtures in the landscape.

Legislative cohesion of levee bank management under the *Planning, Development and Infrastructure Act* enables the state government to reduce flooding risk in South Australia by; establishing levee bank design standards, considering levee bank capacity during future planning, enabling levee banks to be reassessed and action to be taken if the structure no longer meets appropriate risk standards and providing ongoing financial, expertise and experience to appropriately maintain and manage levee banks. The Victorian levee bank management guidelines could be utilised when developing ongoing levee management plans.⁴⁴

³⁵ *Landscape South Australia Bill 2019 (SA)* s 28 (1) (a), (5).

³⁶ *Ibid* s 108(1).

³⁷ *Ibid* s 102 (3).

³⁸ Above n 11, *Burns Review*, page 59.

³⁹ *Natural Resources Management Act 2004 (SA) Planning, Development and Infrastructure Act 2016 (SA)*; South Australian Planning Policy Library.

⁴⁰ *Planning and Design Code (SA)*.

⁴¹ State Government of Victoria, Department of Environment, Land, Water and Planning, *Levee Management Guidelines*, 2015, page 7.

⁴² United Nations Office for Disaster Risk Reduction <https://www.unisdr.org/we/inform/terminology>.

⁴³ State Government of Victoria, Department of Environment, Land, Water and Planning, *Levee Management Guidelines*, 2015, page 9.

⁴⁴ *Ibid*, page 29.

Due to the potential permanency of these structures it is recommended that levee bank design standards be provided for under the Building Code of Australia. A national unified design standard would ensure design cohesion and risk minimisation for the community. The Building Code could utilise existing levee construction requirements developed in Victoria.⁴⁵

Maintenance, regulation and compliance of structures

Currently, the responsibility of maintaining dams on private property and public land resides with the landowner. The LGA recommends that primary responsibility remains with the land owners.

The current responsibilities for levee bank maintenance are not clear. For example, there may be instances of levee banks being built by public authorities on private land and maintenance agreements existing between the two parties. The LGA recommends that where a levee bank is on private property and it is deemed not have the capacity to impact either positively or negatively more than the owners own property, the owner has the responsibility to manage the structure. However, if the levee bank on private property is deemed to be of high strategic flood mitigation importance for the community, then the state government may need to consider sharing management responsibilities by establishing easements.

The Upper South East Drainage Scheme is an example where land was compulsorily acquired as a statutory easement.⁴⁶ Here, the landowner retained ownership of the land upon which the Minister constructed the drain network. Easements established by the Minister would enable ongoing levee bank management in the state.

Ongoing management and maintenance roles and responsibilities for levee banks whether on public and private land should be clearly understood by all levels of government, land owners and the community. To ensure compliance with established maintenance and management standards, for appropriate dam and levee banks on private property, the LGA recommends that state government consider drawing parallels from current state fire prevention regulation.⁴⁷

Placing responsibility for risk reduction on landowners is not a new concept in South Australia. The *Fire and Emergency Services Act*⁴⁸ places responsibilities on private land owners, with associated penalties to take reasonable steps to prevent or inhibit the outbreak⁴⁹ and spread⁵⁰ of fire through the land, protect property on the land from fire⁵¹ and to minimise the threat to human life from fire on the land.⁵² Additionally, it establishes authorised persons⁵³ who are responsible for assessing the extent of bushfire hazards within relevant areas, assisting councils in providing advice and information to any relevant bushfire management committee and providing bush prevention advice to landowners.⁵⁴ Authorised persons also have powers to issue notices of compliance,⁵⁵ with associated penalties⁵⁶ and to enter private land⁵⁷ to ensure compliance has occurred or to proceed with necessary works to ensure compliance.⁵⁸

⁴⁵ State Government of Victoria, Department of Environment, Land, Water and Planning, *Levee Management Guidelines*, 2015, page 25.

⁴⁶ *Upper South East Dryland Salinity and Flood Management Act 2002* (SA) s 12, 12A and 12B originally established the easements. Management of the drainage system is now provided for in the *South Eastern Water Conservation and Drainage Act 1992* (SA).

⁴⁷ *Fire and Emergency Services Act 2005* (SA) Part 4A.

⁴⁸ 2005 (SA).

⁴⁹ *Ibid* s 105F (1) (a).

⁵⁰ *Ibid* s 105F (1) (b).

⁵¹ *Ibid* s 105F (1) (c).

⁵² *Ibid* s 105F (1) (d).

⁵³ *Ibid* s 105A.

⁵⁴ *Ibid* s 105D.

⁵⁵ *Ibid* s 105F (5), (6).

⁵⁶ *Ibid* s 105F (8).

⁵⁷ *Ibid* s 105J (1).

⁵⁸ *Ibid* s 105J (6).

Local government has expressed the importance of ensuring dam and levee banks are maintained to minimise flood risk and that ongoing regulation and compliance is necessary. Some councils have already assumed some roles regarding authorising construction and maintaining some of these structures (levee banks), as part of their general roles.⁵⁹ However, for councils to successfully maintain these structures they are going to require ongoing financial support.

Local government has also expressed that some councils lack the capacity to undertake a successful regulation and compliance oversight role. Many councils do not have employees with the relevant flood, water and engineering knowledge and experience required to undertake this kind of role. Additionally, not all councils have the financial capacity to employ an individual of this type.

The LGA recommends that this compliance supervisory role be undertaken by state government as part of the improved South Australia wide approach to flood management.⁶⁰ This role is particularly suitable to state government as DEW are already responsible for the levee banks along the lower Murray River⁶¹ so they have existing employees with the suitable experience and knowledge. State government also has, if deemed necessary, powers to establish easements to maintain levee banks. The LGA also suggests integrating monitoring requirements, with associated fines into the proposed databases to assist with supervision.

Information gathering

The LGA appreciates DEW's endeavour to create a database to collect, update and share information regarding dam and levee banks location, size and risk rating.⁶² This information can aid local and state government, not only in flood management planning, but also in implementing other successful planning, development and risk reduction strategies to produce more resilient and innovative communities.⁶³

The LGA recommends that any information gathered or any state government action should not negatively impact current or future commercial endeavours undertaken by local government or their organisations.

General information gathering

The LGA believes there would be benefits to all levels of government from general research into the overall costs and benefits of dam and levee banks management. This information could assess not only financial, successful planning and safety considerations but also environmental and community resilience⁶⁴ capabilities. The research could then be utilised to better direct funding and offer additional focus during strategic planning processes. Good quality, reliable and accessible data relating to flood management is important in relation to emergency planning and response.

Additionally, collating the state-wide flood mapping is necessary to determine which communities may be more susceptible or of a higher disaster risk to flooding.

The Tasmanian Flood Map Project⁶⁵ is an example of cooperation between all tiers of government and across agency boundaries to deliver to Tasmanian communities;⁶⁶

⁵⁹ Jeff Tate Consulting, *Stormwater Narrative Report*, 2013, ECM 509073, page 8.

⁶⁰ Government of South Australia Department for Environment and Water, *Priorities for Improving Flood Management in South Australia Draft Position Paper for Consultation*, February 2019.

⁶¹ Government of South Australia Department for Environment and Water, *Improving Dam Management in South Australia Draft Position Paper for Consultation*, February 2019, page 3.

⁶² Above n 2, 3 and 4.

⁶³ Government of South Australia, *Landscapes Directions – Landscape SA Bill*, 2019; Local Government Association of South Australia, *Local Government Emergency Management Framework Draft*, ECM 672733 pg. 21 Strategic Objective number 4.

⁶⁴ Draft National Disaster Risk Reduction framework, 2018, National Priority 2 Accountable decisions, Page 13.

⁶⁵ Tasmanian Government, Department of Premier and Cabinet, *Tasmanian Flood Mapping Project*, <
<http://www.dpac.tas.gov.au/divisions/ossem/tasmanianfloodmap> >

- a hydrologically correct high resolution digital terrain model; and
- a state-wide flood hazard map; and
- a detailed local flood studies grants program for municipal councils.

The LGA believes the South Australian community would benefit from a project similar to that of the Tasmanian Flood Map Project to collate state-wide flood mapping. This kind of project has the potential to enable fundamental integration of water management across the state and to address South Australia's lack of accuracy concerning hydrological information.

The LGA recommends that any flood mapping developed should be 'user friendly' to assist in educating members of the public about flood risk. Additionally, the mapping should not only reflect existing works and infrastructure projects but also be flexible enough to be updated from time to time to allow for more development that may impact the flow of flood waters and either reduce or increase the flood risk.

The management of flood waters should only be required where existing development needs to be protected and not subject to increased risk. Management of flood waters should not be applied to an undeveloped area simply to allow development. General flood mapping information, as recommended here, would enable councils to better plan development and avoid risk by restricting flood-sensitive development.

Legacy issues

The historical and current lack of legislative and regulatory cohesion for dam and levee bank management has resulted in few (if any) comprehensive records existing, that the LGA is aware of, regarding location, design, size, ownership and maintenance of dams and levee banks across South Australia. As addressed above, the lack of legislative and regulatory cohesion has also resulted in variance of design and risk reduction requirements across the state.

The LGA notes the practical difficulties in gathering existing information (conducting an audit) of dams and levee banks in South Australia but supports the development of a database that educates and encourages private land owners to take responsibility for maintaining and undertaking risk management for structures on their property.

The LGA believes that practically, to educate, identify, register and provide a priority/risk rating to all levee banks and dams in the state will be a time consuming and expensive endeavour. It may, in some circumstances not even be possible to identify all structures depending on the information passed from previous to new land owners.

The LGA is not satisfied with the proposed approach to deal with existing, legacy, dam and levee bank structures. The LGA recommends further research be conducted, to better define and identify key strategic dam and levee banks within the context of holistic water management in South Australia.

The LGA recommends DEW provide a more practical and strategic approach to gathering legacy structure information to better utilise local and state government's time and financial resources. For example, the state could utilise existing flood mapping or aerial data imaging to identify legacy structures deemed to be of strategic importance that require immediate attention.

Some examples of legacy structures local government have expressed as being of strategic importance requiring immediate attention are structures with dense populations downstream, dams of a specific size or depth (3-10m) and identifying and controlling failure points in levee banks. The LGA encourages

⁶⁶ Tasmanian Government, *Floodplain Mapping in Tasmania*, < <https://dipwwe.tas.gov.au/water/water-monitoring-and-assessment/hydrological-assessment/floods/floodplain-mapping> >.

DEW to consult further to determine the strategic focus when gathering information regarding legacy structures.

The LGA recommends that DEW conduct an audit to identify the issues that exist with current dams and levee banks. Once the scale and scope of the current legacy issues are identified the state, local government will be in a better position to develop effective methods for addressing the issues.

Database Management

The LGA supports the proposed creation of dam and levee banks databases. The LGA recommends that these databases should not only capture information regarding location, size, depth and risk rating of structures but also be utilised for regulation of dams and levee banks where new risk considerations like updates to structures, maintenance or rehabilitation works and records of any previous failures can be captured and monitored. This recommendation could be bought in line with the *Private Dam Maintenance Management in Emergencies Guidelines* (PDMMEG) which recommends taking photos to help aid with monitoring of dams.⁶⁷

Requiring the database to be constantly updated will assist in better identifying structural risk factors for downstream dams and enable the cascading impact in a dam break event to be reduced or eliminated. As an increase in an upstream dam's risk rating impacts all downstream dams, levee banks and other water infrastructure's risk rating. Database update requirements enable asset management plans to be tracked and reviewed and may also provide a location where state government can educate land owners of their responsibilities to maintain the watercourse and zone in which the levee is constructed.

The LGA recommends the databases be made available for asset management and strategic and planning purposes to relevant state and local government authorities, emergency services, the Stormwater management Authority and catchment based boards. Additionally the database should enable information to be passed onto new landowners, and perspective landowners, for inquiries to be conducted into dam and levee bank structures on a property as part of the due diligence physical property inspection process new buyers undertake. The information made available to landowners should not only include asset information (including the relevant management information) but should also include additional complimentary information on any flood mapping data that is relevant or has been utilised in hazard mapping or risk assessments. This will help encourage and enable private land owners to take responsibility for structures on or structures that benefit their property. The LGA recommends placing more management responsibilities on private land owners who benefit from these structures.

The purpose for the databases on dam and levee banks and gathering the information on location, size, risk rating and any changes or new developments that affect this information is to benefit the community by helping to develop better water management and flood mitigation strategies.

The LGA believes the cross-organisational nature of a database like this will require state co-ordination to ensure top down communication to relevant bodies.

The LGA also notes the initial and ongoing cost requirements of creating and maintaining a comprehensive database, as proposed. The LGA recommends that state government funding is utilised to ensure ongoing successful cross-organisational integration of the database.

⁶⁷ Private Dam Maintenance and Management in Emergencies Guidelines, part 8.3.

Conclusion

In conclusion, the LGA recommends further and more all-inclusive research and information regarding South Australia's flood and water needs to be gathered in order to successfully implement the fundamental integration of water management.

The LGA acknowledges the councils that actively participate in the management and upkeep of important water structures, have undertaken thorough flood mapping and water catchment analysis to ensure public safety and to support the environment and which have undertaken commercial endeavours involving water to financially benefit the community.

In order to determine more effective ways to address issues discussed in this paper DEW may consider undertaking some kind of pilot project, in conjunction with local government, to utilise existing water information to help them develop a flood and water risk matrix which identifies areas of focus to aid in the implementation of a state wide integration of water management approach.

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