

EXECUTIVE SUMMARY

This summary provides an outline of the drivers of change, identification of best practice flood management objectives (that in turn can be compared to the City of Salisbury processes), discussion of key issues and gaps and provides strategies to update processes to best practice.

Drivers of change

Along with a shift in focus from greenfield development to urban consolidation and residential infill, Salisbury is responding to the prospect of a changing climate and the flood risks and opportunities this brings. Each of these areas of change is a driver for an integrated approach to floodplain planning across the Council area. Drivers of change include:

- Increased urban greenfield growth upstream of the City of Salisbury, contributing to increasing stormwater flows;
- Increased desire for infill development to promote appropriate planning outcomes, supported by The 30-Year Plan for Greater Adelaide and Council's Growth Action Plan;
- Implications of climate change and increased climate variability, including recommendations associated with "Adapting Northern Adelaide";
- Lessons learnt from previous local flood events and associated learnings interstate;
- Best practice flood management guidelines including the Australian Government's "Managing the floodplain: a guide to best practice in flood risk management in Australia (Handbook 7)";
- Increased community expectations; and
- Legislative requirements to ensure the implementation of appropriate duty of care responsibilities.

The community and government need to recognise the inherent risks associated with living in a floodplain, and that there will always be some level of residual risk after management measures, including mitigation and land use planning measures, are implemented. The level of residual risk will vary depending on how exposed areas of the floodplain are to flooding, the development controls that were in place when the area was developed, and the measures implemented to manage flood risk.

Catchments, stormwater and flooding

Flooding is an overflowing of water on to land that is normally dry and flood events are generally described as either riverine flooding, flash flooding, coastal flooding or a combination of these. Watercourses in the City of Salisbury include the Little Para River, Adams Creek, Cobbler Creek and Dry Creek which flow generally west from the hills. The catchments of these watercourses extend east beyond the City of Salisbury area to rural living areas of adjoining councils. In the urban and developed areas of the City of Salisbury, stormwater flows supplement flows to these watercourses. Stormwater is defined



as any rain that falls on roofs or collects on hard or paved surfaces including roads. Increasing proportions of impervious catchment (as a result of development) and subsequent increasing need for drainage have led to the development of a network of stormwater drains that intersect natural watercourses.

In the City of Salisbury flood events usually occur as a result of combined stormwater and riverine flows. Although there are no prescribed requirements relating to how councils manage flood waters, stormwater management planning provides a mechanism for the management of flood water in urban areas.

Review against principles of best practice

Managing the floodplain – a guide to best practice in flood risk management in Australia – AEMI Handbook 7 describes 8 key principles of a best practice approach to flood risk management. Table A reviews the City of Salisbury's performance against these 8 principles.

Table A City of Salisbury's performance against best practise principles

Principle	Status and opportunities for improvement
A cooperative approach to manage flood risk	The State-Local Government Stormwater Management Agreement aims to support catchment scale planning to ensure adequate consideration of flood protection, through the establishment of the Stormwater Management Authority whose functions include liaising with, facilitating and supporting State and Local government authorities. The State Stormwater Strategy describes the need for coordination, cooperation and a catchment approach as critical to achieving the greatest community benefit from mitigating against flood risk. As many of the catchments within the City of Salisbury include some area of adjacent councils, it is critical that the Council work with these neighbouring Councils in all aspects of stormwater modelling and mapping, risk assessments and risk mitigation action (high priority). Where community engagement is required, working together could achieve greater efficiencies and ensure consistency in messaging.
A risk management approach	The Stormwater Management Planning Guidelines (SMA, 2007) require stormwater plans to identify risks and opportunities including the potential for flooding, the nature and impact of flooding on properties, and the positive and negative impacts of future development on flooding. Existing stormwater management plans have considered risk however the absence of stormwater management plans for some catchments means this approach is not being followed Council-wide. The Northern Adelaide Flood Hazard Risk Management Report (DEWNR, 2016) identifies the lack of flood hazard mapping as a key limitation to the risk assessment. Progressing flood hazard mapping is required to enable the recommended further detailed analysis and re-evaluation (high priority).
A proactive approach	A proactive approach involves considering the full range of flood risks early in the process of developing strategic land-use plans in order to understand the development capability of land. The absence of recent flood mapping within the City of Salisbury makes it difficult for a pro-active approach to be applied.

Principle	Status and opportunities for improvement
	Managing flood risk while supporting development intensification requires limiting the types of development allowable at specific locations considering flood hazard and using development conditions to reduce residual risk. Without flood mapping within the Development Plan, it is difficult for Council planners to appropriately assess development applications and apply development controls. Progressing flood hazard mapping is required to inform and support land use planning (high priority).
A consultative approach	Public consultation is an important element of understanding and managing flood risk however the City of Salisbury has not proactively undertaken community engagement relating to flooding. The Stormwater Management Planning Guidelines (SMA, 2007) expect engagement with staff, elected members and the local community. No reference to engagement is provided within the Salisbury Escarpment SMP however engagement with a number of stakeholders was undertaken as part of the development of the Cobbler Creek SMP. Developing a community engagement plan is required to support stormwater management planning and information provision (high priority).
An informed approach	Investigations and modelling that provide information on flood behaviour are required to manage flood risk. This information must be maintained and improved as conditions such as catchment development and rainfall patterns change. The City of Salisbury is currently undertaking a number of flood modelling projects and it will be important that regular update of the models be planned and resourced into the future (high to medium priority).
Supporting informed decisions	It is important that flood information is readily accessible to provide the basis for informed decisions. Historically the City of Salisbury has not made flood mapping widely available. Legal advice received for this project recommends that Council obtains accurate and up to date flooding information for its area as soon as possible and formulates and implements a strategy for dissemination of this information to the public (high priority).
Recognition that all flood risk cannot be eliminated	The community and government need to recognise that living in the floodplain has an inherent risk, however at present it is likely that many members of the community are not aware that they are living in a floodplain. The community needs to be made aware of all the risks including the residual risk. Community engagement is required across all the Council activities and a community engagement strategy should be prepared to enable a consistent and informed approach (high priority).
Recognition of individual responsibility	Individual responsibility and self-reliance are critical for communities to prepare for, respond to and recover from flood events. This requires not only knowledge and awareness of the flood risk, but also understanding of actions individuals and households need to take to minimise damage to property, health and safety. The City of Salisbury has a key role to play in engaging the community to understand their risks and responsibilities (high priority).



Availability of flood risk information

There is a lack of recent model data and mapping relating to sea level rise and flood inundation that consistently addresses flooding issues across the City of Salisbury. Quality flood management studies and inundation mapping is a prerequisite to flood planning and management. It is understood that a number of investigations are currently in progress. Once flood mapping is complete, it should be made available to all stakeholders including State government agencies and the community.

Legal advice (see Appendix A) states that Council has no express obligation to provide or make available floodplain mapping however it is noted that in certain circumstances, the failure to make floodplain mapping available that is in the Council's possession may expose the Council to some legal risk.

In addition, best practice flood risk management (objective 5 - see Section 5.0) requires making information on flood risk readily available, so that government, risk managers and community can make informed risk management and investment decisions.

The low confidence in the assessments undertaken as part of the Northern Adelaide Flood Hazard Risk Assessment as a result of the lack of recent flood data led to a recommendation to undertake further detailed analysis and re-evaluation to improve the confidence of the risk assessment and prioritise flood risk treatments. Flood mapping outputs would enable this to occur and emergency management in the region to be better informed.

The general insurance industry has developed and licenced the National Flood Information Database (NFID) for use by insurers in determining flood risk. This specially developed database uses publicly available flood information sources from state and local governments. Where flood risk information is not available, insurance companies may not make flood insurance available. By not making flood mapping available, the Council may be indirectly preventing individuals from obtaining flood insurance, or may be influencing the premiums associated with flood insurance.

The need for Council to have access to updated comprehensive flood management data and mapping is considered to be critical and therefore a high priority action.

Community engagement

Best practices flood management processes indicate that community engagement should start early in a process, even where there are considerable unknowns and information gaps. The community should be encouraged to contribute to the understanding of flood behaviour and how risks are managed.

Community resilience may be improved by increased protection or because the community is better informed on flood risks and how to respond to the flood threat. Communities need to recognise that all risks cannot be eliminated and that they have an individual responsibility to manage risk.

Several years ago the City of Charles Sturt undertook wide-spread community engagement to inform and educate landowners in flood prone areas. Their experience may provide useful when planning engagement in the City of Salisbury.

In association with updating flood management data and mapping, Council should prepare and implement a community engagement program that includes information provision, stormwater

management planning, understanding and managing community expectations and risk management (including preparation, response and recovery from flood events).

Existing City of Salisbury flood and stormwater management planning

Stormwater management plans provide the mechanism for managing flood waters in urban environments such as the City of Salisbury. Approved stormwater management plans prepared following the Stormwater Management Authority's guidelines are eligible for State funding, a further incentive to prepare such plans.

It is understood that although two stormwater management plans have been prepared in the last 2 years, these have not been approved by Council and hence Council is not eligible for State government funding to implement these plans. Finalising and endorsing these plans should be undertaken as a high priority.

City of Salisbury Development Plan

Compared to best practice planning models and other Councils in South Australia, Salisbury Council's Development Plan fails to satisfactorily address flood management planning. A key contributing factor is the lack of reference to floodplain plans. As an example, this omission effectively means that many land uses and activities referred to in the *Development Regulations 2008* (particularly noted in Schedules 1A, 2, 3 and 4), which would otherwise be "development" within a floodplain area delineated in the Development Plan, escapes the definition of development and therefore may intentionally contribute to flooding issues. Although with respect to dealing with merit and non-complying development applications, it is noted that in the Environment, Resources and Development Court case of *Reed v District Council of Mallala* [2016] SA ERDC 10, the Court accepted that flood mapping not incorporated into the Development Plan can be used as a reason to support a refusal if such mapping is supportive of existing policies. Notwithstanding this matter, Council still required to have had the flood maps prepared to an appropriate level to be of relevance to the Court and the associated Court experts.

Development Plan policies (including flood mapping) should be updated as soon as practical (medium to high priority), while acknowledging that there may be some deficiencies in the mapping. Floodplain mapping is rarely fully up-to-date and provides a district / neighbourhood assessment (rather than individual allotment level that factors in detailed site levels and buildings/structures).

Suggested strategies

Having regard to the objectives for achieving best practice processes, the following strategies are proposed for Council's consideration and are grouped in the following categories:

- Governance / executive management responsibilities
- Floodplain mapping, management and risk mitigation
- Policy and planning
- Provision of information

Priorities have been assigned based upon each strategy's potential to achieve best practice flood risk management and address legal advice obtained for this project.



Governance / executive management responsibilities

1. Notwithstanding the legal obligations and best practice, there may be community expectation for Council to take action to address flood and stormwater management issues. Understanding and managing community expectations regarding flooding and stormwater should be undertaken as a **high priority**.
2. The City of Salisbury should work with the Stormwater Management Authority, DEWNR, Natural Resources Adelaide and Mount Lofty Ranges, DPTI and adjoining councils to coordinate the development of flood management and stormwater management plans (**high priority**). This collaboration should discuss issues associated with consistent approaches to deal with emergency management events, capital works and required changes to planning policy.
3. The Councils should identify a coordinated response / emergency action plan in times of a significant flood event (**high priority**). For instance, what is Council's responsibility to lead or partner with State Emergency Service regarding a flood event? What have been the learnings from other Councils in past events? Are there procedures in place that can activate a rapid response?

Floodplain mapping, management and risk mitigation

4. Reference to flood events should be referred to with reference to the Annual Exceedance Probability (AEP) (**high priority**). AEP refers to the probability each year of a certain size event being exceeded and reinforces that there is an ongoing flood risk every year.
5. Council should as a **high priority** obtain updated floodplain modelling and mapping across the entire Council area. Flood investigations should include:
 - > Velocity of floodwaters;
 - > Depth of floodwaters;
 - > Combination of velocity and depth of floodwaters;
 - > Effective warning time;
 - > Rate of rise of floodwater;
 - > Existing and future (say within 30 years) development / growth scenarios that may impact on flood planning and management.

Floodplain mapping should show inundation depths associated with agreed flood return intervals, as a minimum 10%, 2% and 1% AEP.

This strategy is consistent with the priorities identified in the Adapting Northern Adelaide (Climate Change Adaptation) Action Plan 2016-2019.

6. Regular review and update of floodplain modelling and mapping should be planned and budget for (**high to medium priority**). As new information becomes available, for example regarding catchment development or the impacts of climate change on rainfall and runoff, this should be incorporated and where possible modelling updated.
7. Stormwater management planning provides a mechanisms for flood management planning in urban areas.



Stormwater management plans should be prepared for all catchments within the City of Salisbury (**high to medium priority**). These should be prepared following a whole of catchment approach and following the guidelines of the Stormwater Management Authority. Where catchments cover neighbouring councils, the plans should be prepared jointly.

8. Stormwater management plans should be reviewed regularly with reference to any changes in catchment conditions or reviews of flood modelling and mapping (**medium priority**).
9. Floodplain mapping and management should have a long term outlook and influence Council's Strategic Plans. Strategic Plans (such as Salisbury Growth Action Plan) should consider issues relating to future flood risk (having regard to best available information relating to greenfield and infill developments, stormwater flows, within and external to the Council area) and residual flood risk (having regard to existing and future development implications once capital works and development control plans are implemented (**high to medium priority**)).
10. When considering flood management planning (capital works and planning policy responses), a risk management approach should be implemented that enables investment to be focused on understanding and managing flood risk where it is needed most (**high priority**). For instance, flood management can be prioritised against criteria relating to location of most vulnerable sites / community nodes, and regional / state significance infrastructure that is fundamental to responding to a natural disasters (including flooding).

Policy and planning

11. A Flood Management Development Plan Amendment should be prepared as soon as possible that incorporates the most up to date available flood mapping and policies (**high priority**) (refer to appendices as examples).

Changes to design allowances for flood inundation may also be required. This strategy is consistent with the priorities identified in the Adapting Northern Adelaide (Climate Change Adaptation) Action Plan 2016-2019.

12. A spatial database should be developed that allows development assessment staff to rapidly identify properties subject to flood risk at all Annual Exceedance Probabilities (AEPs) referred to in the Development Plan (**high to medium priority**).

Council should investigate whether they wish to identify locations where 'at risk development' should not occur. A Development Plan Amendment may then be required to identify any such locations within the Development Plan. This strategy is consistent with the priorities identified in the Adapting Northern Adelaide (Climate Change Adaptation) Action Plan 2016-2019.

13. Council in partnership with the Local Government Association and other interested Councils should advocate for and consider assisting the Department of Planning, Transport and Infrastructure to:
 - > Develop flood management policies relevant to the proposed State Planning Policies, Planning and Design Code, Design Standards, Practice Directions and / or Practice Guidelines (**high to medium priority**). These inputs can consider sample Victorian Models (refer to appendices) that take a risk management approach to development (for instance, not



requiring development applications for some minor structures / fences and/or stormwater reports).

- > Develop a process that minimises resources and time required to update planning policy (including flood mapping) as a result of updated flood mapping (**high to medium priority**).

Provision of information

14. Council must ensure flood modelling and mapping outputs are distributed to relevant stakeholders in a timely manner (**high priority**). Stakeholders may include government agencies, infrastructure providers, and Council departments responsible for updates to Development Plan policy, neighbouring Councils and the community.
15. Disclaimers must be included on all flood maps to protect Council and ensure users of the information understand the limitation of flood mapping and do not rely on it but rather make and rely on their own enquiries (**high priority**).
16. Council should prepare a community engagement strategy / action plan that articulates how floodplain mapping and associated information is to be released (**high priority**). Concurrently Council should partner with the SES to provide emergency management information on to prepare for, respond to and recover from flood events.
17. Once Council has obtained and made available information on flood risk, Council should prepare information to be included with responses to requests for Section 7 Statements under the *Land and Business (Sale and Conveyancing) Act 1994* (**medium priority**). This information should draw the purchaser's attention to other Council website information (including gaps in information / caveats associated with floodplain mapping) and that they should make their own enquiries in relation to flooding risks affecting the property.