

Central West Councils  
**SALINITY**  
**WATER & QUALITY**  
**ALLIANCE**

## Senate Inquiry into Stormwater Management in Australia

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Submission from Central West Councils Salinity &  
Water Quality Alliance

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Committee Secretary  
Senate Standing Committees on Environment and Communications  
PO Box 6100  
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Canberra ACT 2600

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## About Us

The Central West Councils Salinity & Water Quality Alliance (Alliance) represents a membership of 19 Councils across the Central Tablelands and Central West Local Land Services regions of New South Wales. The aim of the Alliance is:

*To be an active partnership of Councils across the Central West of NSW, engaging all tiers of Government and our Communities, contributing to the protection and enhancement of the environmental, social, economic and cultural condition of our part of the world.*

As such, the Alliance works closely with its member Councils across a wide range of environmental issues with waterway health and subsequently stormwater management being a key focus of the Alliance. Stormwater management is identified as a high priority across a range of actions within the Alliance Five Year Plan including:

- (Aquatic) Bed & bank stabilisation eg. Erosion control
- Management & connectivity of water movement
- Integrated water cycle management
- Manage point & diffuse source pollution
- Adopt climate change actions in Strategic Plans
- Integrate S<sup>2</sup>S (Stormwater to Smartwater) stormwater policy into Council Policy

The Alliance has invested significantly in a range of on-ground and capacity building actions to see improved stormwater management across its member Councils in order to meet the targets as listed above. This includes the Alliance being a member of the Cooperative Research Centre for Water Sensitive Cities to allow the member Councils access to the most current research and best management practice stormwater solutions.

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## Introduction

As the driest inhabited continent on earth, combined with the looming spectre of Climate Change, Australia cannot afford to continue to treat stormwater as a nuisance that needs to be dealt with. Stormwater has traditionally been collected and transported from urban areas in as quick a fashion as possible with little regard to the adverse environmental and social impacts that stormwater managed in this manner results in. It is time that stormwater in Australia is seen as a valuable resource and managed in a fashion that provides multiple benefits for all Australians.

This is a submission by the Central West Councils Salinity & Water Quality Alliance (Alliance). The comments are the views of the Alliance staff and not necessarily of the member Councils of the Alliance who have not all had adequate time to fully review this submission.

The Alliance is grateful for the opportunity to provide a submission to the Senate Inquiry into Stormwater resource in Australia, including a number of recommendations in relation to ensuring that stormwater management in Australia allows for and promotes healthy waterways, healthy communities, water security for communities from diverse and sustainable sources and flood prevention in populated areas. As such, this submission focuses on the following terms of reference for the Inquiry:

- The quantum of stormwater resource in Australia and impact and potential of optimal management practices in areas of flooding, environmental impacts, waterway management and water resource planning;
- The role of scientific advances in improving stormwater management outcomes and integrating these into policy at all levels of government to unlock the full suite of economic benefits;
- The role of stormwater as a positive contributor to resilient and desirable communities into the future, including 'public good' and productivity outcomes; and
- Model land use planning and building controls to maximise benefits and minimise impacts in both new and legacy situations.

## List of Recommendations

1. In order to diversify and secure potable water supplies across Australia, detailed risk assessments and environmental impact assessments should be conducted across all water authorities in regards to water security, focussed on the cost benefit analyses as to reuse of stormwater for potable purposes.
2. The Government looks to the CRC for Water Sensitive Cities to understand the full suite of current best management practices for stormwater including the economic benefits and how these practices can best gain widespread adoption.
3. A single government agency takes responsibility for stormwater management including providing current best management practice advice and issuing of all relevant permits and approvals in relation to stormwater reuse.
4. In order to realise the potential of the stormwater resource as a contributor to resilient and desirable Australian communities, federal leadership is required. Funding should be provided to assist communities to transition to WSUD principles with the Government to leverage the States to provide a consistency of management and enforce WSUD principles to be incorporated into all new developments.
5. The management of stormwater to be decentralised in all new developments to reduce the infrastructure installation and maintenance burden on Local Government by implementing a point based system for WSUD offsets.

## **The quantum of stormwater resource in Australia and impact and potential of optimal management practices in areas of flooding, environmental impacts, waterway management and water resource planning**

The volume of the stormwater resource in urban areas throughout Australia is immense and almost exclusively undervalued. When viewed in the context of flooding, environmental impacts, waterway management and water resource planning, the optimal management related to stormwater in each of these areas has the potential to completely shift the paradigm of urban planning and stormwater management.

Urban development can result in an increase of more than 500% in the volume of water entering urban waterways. While this volume alone can have a major effect on waterway health, when combined with the increased velocities generated by hard urban stormwater infrastructure and the associated pollutants, the impact on aquatic systems can be devastating. Receiving waterways in urban catchments are often highly degraded, incised through massive erosion events, polluted through stormwater contaminants and devoid of in-stream vegetation.

If stormwater is simply viewed as a resource to be harvested for reuse there is necessarily a complete shift in how stormwater should be managed. When considered as a potential source of potable water, stormwater will no longer be seen as something that should run through an urban environment collecting pollutants that need to then be removed through costly processing. This is where the paradigm shifts to ensuring optimal water quality and by extension, waterway health, at every step in the journey from rainfall to reuse.

By managing stormwater through Water Sensitive Urban Design (WSUD) principles it is possible to positively impact all areas of stormwater management without viewing each area of stormwater management as an individual and isolated issue. By way of example, introducing a stormwater treatment train incorporating residential water tanks, urban raingardens, biofiltration swales, healthy and resilient creeks and drainage lines for stormwater conveyance and stormwater wetlands would result in a reduction in the risks of localised flooding, have positive environmental impacts through habitat creation, improve the quality of water entering receiving waterways while also reducing flow volumes and velocities, and provide a source of stormwater capture for reuse.

A major benefit of using stormwater for potable purposes is the diversification and security of the water supply. Most regional communities rely on a single source of water for their potable water supply which in the majority of cases is either a water supply dam / reservoir or bore water. Should a major incident occur where a single water supply source is rendered unusable for potable water purposes, or simply the dams run dry due to severe drought, the community would be grossly inconvenienced with major health issues likely to ensue.

Areas and towns dependant solely on bore water for their water supplies would no longer remain viable if their ground water was polluted through coal seam gas exploration or other sources of pollution. Implementation of stormwater harvesting has the potential to provide insurance against a major disruption to traditional water supplies as well as to reduce the environmental impacts of groundwater systems and groundwater dependant ecosystems.

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**Recommendation:** In order to diversify and secure potable water supplies across Australia, detailed risk assessments and environmental impact assessments should be conducted across all water authorities in regards to water security, focussed on the cost benefit analyses as to reuse of stormwater for potable purposes.

## **The role of scientific advances in improving stormwater management outcomes and integrating these into policy at all levels of government to unlock the full suite of economic benefits**

A great volume of research into improving stormwater management has been completed in recent years in Australia with a great deal of further study continuing. Australia is seen as a world leader in this field of research thanks largely to the Cooperative Research Centre for Water Sensitive Cities (CRC) of which the Alliance is a stakeholder. The CRC has four distinct research programs as listed below:

- Program A – Society
- Program B – Water Sensitive Urbanism
- Program C – Future Technologies
- Program D – Adoption Pathways

The CRC is providing cutting edge research into stormwater management and the development of new techniques and infrastructure for managing stormwater. Research is proving that the installation of WSUD infrastructure such as biofiltration systems when designed appropriately can have the following benefits:

1. Reduce the volume of stormwater entering downstream receiving waters
2. Reduce the velocity of stormwater entering downstream receiving waters
3. Increase the quality of stormwater
4. Improve amenity of areas where installed
5. Reduce the heat island effect of urban areas
6. Reduce impact on / requirement for traditional stormwater infrastructure

Further, where stormwater treatment trains are correctly designed and installed the resultant water is of a quality sufficient for reuse in a variety of situations including for – generally when further treatment takes place – potable use. This has the potential to greatly reduce the burden on existing water supplies and increase the diversity of potable water supplies, thus reducing the risk of a major event leaving communities without access to drinking water. The financial and environmental benefits of water supply authorities and governments not being burdened with increasing dam wall heights or building new dams or major pipelines is immense.

Many countries around the world are looking to the research being delivered by the CRC, and coming out of Australia, to change stormwater management practices in order to provide a host of benefits to their citizens. It is time for Australia to embrace the best management practice of stormwater as a requirement for the health of waterways and the Australian people, as well as for the economic benefits being demonstrated by the CRC.

**Recommendation:** The Government looks to the CRC for Water Sensitive Cities to understand the full suite of current best management practices for stormwater including the economic benefits and how these practices can best gain widespread adoption.



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At present in the context of New South Wales, there exists no single State agency with ultimate responsibility for stormwater. For organisations, including regional Councils, to negotiate the complex bureaucracy to implement stormwater reuse systems has proved a major obstacle. Further, unless individual water authorities identify the stormwater resource as having the potential to increase water security, there is little incentive for them to pursue stormwater reuse.

For WSUD to become standard practice, including stormwater harvesting for reuse, there needs to be clear leadership from government. It is considered necessary that a single agency exists to provide current best management practice advice on stormwater management including the issuing of relevant permits and approvals for stormwater reuse.

**Recommendation:** A single government agency takes responsibility for stormwater management including providing current best management practice advice and issuing of all relevant permits and approvals in relation to stormwater reuse.

## **The role of stormwater as a positive contributor to resilient and desirable communities into the future, including 'public good' and productivity outcomes**

The role that stormwater can play in contributing to resilient and desirable communities into the future is extremely broad. When considered as a resource to be utilised stormwater can be captured for reuse at both a residential and civic level for a range of uses. Residential water tanks can be used – dependant on local regulations and requirements – for garden watering, toilet flushing and laundry purposes as well as for drinking water. All of these uses minimise the burden on potable water supplies.

Civic stormwater capture through WSUD treatment trains can result in water suitable for use in residential gardens through purple pipe systems. Additional treatment can result in this water being suitable for potable use, again reducing the burden on existing potable water supplies and increasing the resilience of potable water supplies by increasing the diversity of sources.

It should be noted that following periods of little to no rainfall, storm events often contribute negligible volumes of water to storage dams as the parched soils consume the rain. This is not the case in urban areas as hardstand surfaces will deliver rainwater to the stormwater system regardless of prevalent weather patterns.

By increasing the use of biofiltration systems in urban areas the volume of vegetation within these areas can be greatly increased while also improving the quality of stormwater. Capturing this filtered stormwater to reuse for irrigation allows for lawns to be watered, even during drought events where water restrictions may in force. Combined, the use of biofiltration systems and irrigated lawns, which assist in holding water in the landscape, can have a great impact on reducing the urban heat island effect and provide valuable areas of recreation space, amenity and shade (dependant on the species selected). The flow on effect is beneficial to public health outcomes through the potential for reduced heat stress and associated deaths during extreme heat conditions, as well as general wellbeing.

**Recommendation:** In order to realise the potential of the stormwater resource as a contributor to resilient and desirable Australian communities, federal leadership is required. Funding should be provided to assist communities to transition to WSUD principles with the Government to leverage the States to provide a consistency of management and enforce WSUD principles to be incorporated into all new developments.

## **Model land use planning and building controls to maximise benefits and minimise impacts in both new and legacy situations**

It is the view of the Alliance that any approved development should see no negative impact on waterways. It is envisaged that this would relate to minor residential development such as the construction of a shed or individual dwelling – any development requiring Development Approval – up to major developments such as residential estates, commercial development sites or major infrastructure developments such as freeway construction projects.

In practice this could work through a system modelled on the existing BASIX (Building Sustainability Index) in use in New South Wales. Under this proposal each square metre of impermeable surface installed would equal one point requiring offset with a suitable WSUD installation to ensure no negative impact on receiving waterways.

An example in a typical residential house build may include offsets such as:

- Installation of appropriately sized raingardens
- Installation of appropriately sized water tanks
- Use of water tanks with small aperture outlet to stormwater system to act as decentralised detention
- Use of permeable paving for driveways to reduce impermeable surface area

An example in a typical major commercial development may include offsets such as:

- Installation of appropriately sized water tanks
- Installation of WSUD tree pits
- Use of biofiltration swales
- Constructed wetlands

Where a development could not meet the requirement to offset the required hardstand surfaces a contribution would be paid to the relevant local agency to engage in waterway rehabilitation projects, WSUD implementation or other stormwater management.

By introducing a system such as this the burden of ever increasing infrastructure construction and maintenance would be alleviated for local government and their existing communities. Not only would this allow for a reduced infrastructure burden on Councils, the resultant public open space not being used for detention basins and overland drainage flows could be better utilised for recreation areas or provide areas to install WSUD features to compensate for existing development.

**Recommendation:** The management of stormwater to be decentralised in all new developments to reduce the infrastructure installation and maintenance burden on Local Government by implementing a point based system for WSUD offsets.

## Conclusion

It is the opinion of the Alliance that the vast majority of the information being sought by this Inquiry lies within the work being completed by the CRC for Water Sensitive Cities, of which the Alliance is a member. Australia is leading the world in stormwater research and it would be neglectful to ignore the wealth of information that is readily available to use while other nations take the lead on stormwater management. Moving towards water sensitive communities through improved stormwater management will provide cost effective solutions to water security, waterway health, liveability of towns and cities and flood resilience.

Thank you for the opportunity to provide this submission. For clarification on any items raised within this submission, or for further feedback as required, please contact the Alliance Project Support Officer, Mr Mick Callan.