

NSW Independent Flood Inquiry

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20 May 2022

2022 Flood Inquiry Submission – NSW Water Directorate

We write in response to the call for submissions on the NSW government's 2022 Flood Inquiry.

The NSW Water Directorate is the peak industry body representing 87 out of 90 of local government owned water utilities (LWU's) in regional NSW. Our mission is to provide independent technical advice to LWU's to ensure they deliver high quality water supply and sewerage services to regional communities in NSW. Further information about us can be found at: <https://www.waterdirectorate.asn.au/AboutUs.aspx>.

Opening comments

In the last few years, regional NSW has experienced unprecedented impacts on water security and water quality arising from drought, bushfire, flooding and the COVID-19 pandemic. This sequence of extreme events has required a renewed focus on the resilience of local water utilities. Regional NSW councils own and operate extensive critical water and sewerage infrastructure spread across expansive catchment areas with a relatively small cohort of dedicated water staff.

The Water Directorate has been calling for water related agencies to collaborate and invest in water utility resilience for regional water providers through capacity building, improved water utility risk management and non-asset solutions such as digital technology. While capital projects have a very important part to play, these are invariably long-term solutions. Short term non-asset solutions are required to monitor, predict, and mitigate risk.

In response to the 2017-2019 drought in particular, the NSW Government's total drought support/water security commitment in regional NSW was about \$4 billion¹. Significant capital funding has been committed by the NSW government for water infrastructure to address water security and water quality challenges in regional NSW. In particular, \$15 million² was committed in the package to truck water into a number of small regional communities that had experienced complete town water supply failure. It was revealing how inter agency coordination and collaboration could be achieved during this severe drought through the Regional Town Water Supply Coordinator when a sharp focus on water security was required.

The consequences of failure of water and sewerage services can be extremely high. Insufficient attention to risk will lead to public health incidents, unacceptable environmental impact and impact on local economies.

¹ Source: NSW DPIE: <https://www.dpi.nsw.gov.au/climate-and-emergencies/droughthub/2020-drought-package>

² Source: <https://infrastructuremagazine.com.au/2019/12/03/urgent-water-infrastructure-funding-for-nsw/>

Water Directorate suggests that the already significant capital investment by the state and Commonwealth governments into water and sewerage infrastructure regional NSW needs to be complemented with non-asset solutions. These include:

- ***Sophisticated strategic planning*** – diversification of water supplies to reduce reliance on climate affected surface water systems. Regional water strategies are crucial to support business cases for interconnection of water supplies between catchments and regional centres. Water security and water quality modelling needs to have regard for the latest climate change modelling.
- ***Invest in capacity building of water utilities*** – develop a minimum standard for water operator training and collaborate with trainers and Registered Training Organisations in training delivery.
- ***Invest in and support water utility business excellence*** – water utility risk awareness and management to reduce future water security, water quality or public health incidents. Business continuity planning and asset management systems
- ***Invest in innovative digital technology*** – improved data and real-time modelling and operation will improve the performance of existing water infrastructure. This would include technologies such as ‘smart’ water meters, online water quality, flow and pressure monitoring connected via the ‘Internet of Things’, digital twins for infrastructure modelling and harnessing virtual or augmented reality tools.

The water sector is responsible for providing water and wastewater services to the community. Water is essential for the health and life of people, for manufacturing essential products and in providing essential services. Resilient water services are required to withstand future challenges such as drought, bushfire, floods, and pandemic.

Australia’s drinking water supplies are increasingly being challenged by events such as floods, bushfires and algal blooms. Existing treatment processes are sometimes unable to manage water quality issues that arise from these events, resulting in ‘do not drink’ or ‘boil water’ advisories being issued. Planning for the future needs to include a focus on strategies for the improved management of water quality during and following extreme events.

We respond to the specific matters found in the [2022 NSW Floods Inquiry Terms of Reference](#) as follows:

1.1 Causes and contributing factors

The causes of, and factors contributing to, the frequency, intensity, timing and location of floods in NSW in the 2022 catastrophic flood event, including consideration of any role of weather, climate change, and human activity;

We would defer to the Bureau of Meteorology’s expertise on this question. Ongoing La Niña weather systems saw two very wet summers, to create heavily saturated catchments that generate enormous volumes of runoff and flooding. As our climate is warming, more water vapour can be held in the atmosphere meaning a trend towards more extreme rainfall and flood events.

It is also notable that clearing in rural catchments and urbanisation through population growth has increased the intensity of runoff and flooding and has created significant water quality challenges.

The water sector, like other sectors, relies on Average Reoccurrence Interval (ARI) information based on historical data to plan, design, and build assets. Whilst we understand the actual period between ARI exceedances is random, the inappropriate use of an ARI is causing significant challenges in our sector. We are now experiencing multiple exceedances with records broken in very short time periods. Assets are being built or repaired/replaced following natural disasters based on the same historical data and modelling approaches.

With the changes in climate we are experiencing, using historical data is not good enough to support risk-based decision making on investments into critical and essential water and sewerage assets. Assets that were replaced and built above the 1 in 100 year predicted river level after the 2017 floods in the northern rivers at significant cost were expected to last many decades but were inundated again in 2022 by flood levels in excess of the 1 in 500 year ARI modelling. Investment in better climate change modelling and projections is needed to ensure investment in critical infrastructure appropriately mitigates climate risk.

1.2 Preparation and planning

The preparation and planning by agencies, government, other entities and the community for floods in NSW, including the accuracy and timing of weather forecasts, current laws, emergency management plans, practices and mitigation strategies, their application and effect;

The water sector has the following arrangements in place:

- At state level, the NSW Energy & Utility Services Functional Area Supporting Plan (EUSPLAN), a Supporting Plan of the NSW Emergency Management Plan³ aims to *detail the arrangements for the coordination of managing severe and sudden disruptions to the supply of energy and/or utility services which require a significant and coordinated response to restore supply* (Paragraph 5).
- At a national level, the Water Services Sector Group (WSSG) *provides an important forum for water utilities to come together to share knowledge and develop capability in the areas of security, business continuity, incident and emergency management and critical infrastructure resilience for the Australian water industry.*⁴ The WSSG is part of the Australian Government's *Trusted Information Sharing Network (TISN) for Critical Infrastructure Resilience* facilitated by the Water Services Association of Australia (WSAA).
- The WSSG has developed *Australian Water Sector Mutual Aid Guidelines* to: *ensure that during times of disaster/emergency, water utilities are able to restore and sustain services more effectively by drawing on available resources from other unaffected areas in Australia. By having these Guidelines in place prior to a disaster/emergency, the process of requesting, coordinating and deploying resources is streamlined, saving time in planning and administration and in locating specialist personnel and equipment.*

³ Available at: <https://www.nsw.gov.au/sites/default/files/2021-04/Supporting-Plan-Energy-utilities.pdf>

⁴ Source: <https://www.wsaa.asn.au/news/introducing-water-services-sector-group>

There are robust emergency management arrangements in place with the local government sector through Local Emergency Management Committees (LEMC's). However, in our opinion, the interaction between the above water sector arrangements and the state and local government sectors during emergencies and incidents requires increased attention. The EUSPLAN (Paragraph 18) provides for Liaison Officers from participating organisations to provide specialist advice to the SEOCON. However, it is not clear that local government water utility managers are empowered to participate with LEMC's as water services specialists.

Although the Water Directorate is involved with EUSFA on behalf of council owned water utilities, they are not documented in the EUSPLAN as participating organisations. Nor is the role of the WSSG for national arrangements in water sector mutual assistance. This contributes to the lack of clear responsibilities when water services are impacted at scale in regional NSW.

The Water Directorate has been participating in a *Town Water Risk Reduction Program*⁵ led by DPE Water that aims to enhance the support available to local water utilities (councils) to manage incidents and emergencies, which was identified as a priority by its stakeholder advisory panel. Two areas emerged as the highest priority:

- Strengthening support for local water utilities to develop more robust incident management plans, and to exercise these more frequently.
- Exploring options to enhance or expand the support available to help the most resource-constrained utilities to respond to incidents.

The replacement cost of water and sewerage assets serving 1.9 million people in regional NSW is \$32 billion. There is a lack of identification of critical water and sewerage infrastructure for large scale emergencies and incidents such as the North Coast floods, or the 2019-20 bushfires. There is very limited evidence that water infrastructure related emergency scenarios are planned for or practiced.

Water and sewerage assets are commonly situated in flood plains. We can't avoid the risk of flooding to these assets, but we can attempt to mitigate the consequences with more resilient assets – 'building back better'. It is important to acknowledge however that we can only mitigate the consequences within constraints (financial, geographical, and technological). We can build assets and systems to be more flood-resilient, but this doesn't mean they are flood-proof.

We will always need preparation and planning by agencies, government, other entities (including council owned Local Water Utilities) to respond to water and wastewater infrastructure failure during such events. This includes the public health impacts that result from a lack of safe water supply and sewage services. The consequences of these impacts have the potential for widespread illness and death as well as economic impacts due to impacted businesses. Emergency Management plans and practices need to have a stronger emphasis on integration of water services as a utility in emergency response to floods and other natural disasters.

⁵ More info at: <https://www.industry.nsw.gov.au/water/plans-programs/risk-reduction>

An integrated approach should also include all agencies and utilities being trained in the use of the Australasian Inter-Service Incident Management System (AIIMS) so that we are all speaking the same language when responding to incidents.

1.3 Response to floods

Responses to floods, particularly measures to protect life, property and the environment, including:

- i. immediate management, including the issuing and response to public warnings;*
- ii. resourcing, coordination and deployment, including with respect to the Australian Defence Force; and*
- iii. equipment and communication systems;*

Water sector regulation is complex. Water services in NSW are primarily regulated by DPE Water, public health is regulated by NSW Health, environment by NSW EPA, and council powers and duties regulated by the NSW Office of Local Government. There is insufficient role clarity between NSW government agencies in responding to emergency and incidents, as well as overlap in legislation, responsibility for technical support, and planning for recovery.

There needs to be increased importance placed upon water and sewerage as essential services, not only for impacted communities, but also to accommodate first responders and enable recovery to commence. Water is essential for the health and life of people, for manufacturing essential products and in providing essential services. Delays to restoring essential services has a significant impact on the length of an emergency or incident and recovery.

There were many unexpected impacts on water and sewerage services during the NSW 2022 floods:

- Flooding was at such an unprecedented height that electrical switchboards housing electrical control and communications systems that power as well as monitor and control water and sewerage systems were severely impacted. Maintaining continuity of water and sewerage services is heavily reliant on electrical supply and communications. Critical water supply and sewage systems were inoperable not because they were inundated, but due to the inundation of critical power supply infrastructure supplying treatment plants and pump stations.
- The lack of Supervisory Control and Data Acquisition (SCADA) system communications to monitor and control water and sewerage systems was compounded by impacts to mobile phone coverage, exacerbating problems with coordination and control of water and sewerage service restoration. When monitoring and communications systems are not available, this greatly increases manual labour input to keep a water or sewerage system operational, as water utilities are 'flying blind'.
- Water and sewerage operations requires skilled operators that are not always easily accessed. The Australian Water Sector Mutual Aid Guidelines are intended to facilitate rapid, short-term deployment of disaster/emergency support to restore critical water/wastewater operations. Ultimately, these Guidelines will enhance the resilience of the Australian Water Sector and the communities that they serve. There is limited to no awareness of the Guidelines in the local government sector, which delayed the delivery of mutual assistance and the restoration of essential services.

- Water and sewerage services are expected to be maintained 24/7/365. The risks to water and sewerage operators due to extensive fatigue were high, impacting on their ability to make good decisions on water and sewerage services. The risk of further water and sewerage service failure on the community was higher as a result.
- The impact on communications was also a significant risk to public health due to the inability to communicate on 'boil water' events where drinking water quality could not be guaranteed. The lack of communication also meant coordination and notifications to the required regulatory agencies was hampered, delaying boiled water alert notification to the public. It would be beneficial to have SMS services to notify customers of boiled water alerts and emergency water supply restrictions (similar to how Communications and Electricity companies are able to issue SMS alerts to customers). Email lists and SMS services are recommended to identify and communicate with vulnerable water customers and key businesses and institutions such as schools, hospitals and aged care facilities. Government agencies such as EPA, NSW Health and DPE could assist.
- A lack of access for chemical supply trucks to some water treatment plants saw some plants within days of running short of chemicals. This could have led to a widespread declaration that water supplies were not drinkable, and a much larger scale boil water alert. A boil water alert is extremely difficult to comply with if homes do not have power supply.
- Road damage and closures significantly impacted access to truck water to villages as well as repair and restore critical water supply infrastructure such as water treatment plants in these locations. Coordination with relevant roads authorities as well as emergency services regarding road access was hampered by loss of communications infrastructure. Information on road hazards and closures is currently a website-based platform. Significant delays and inefficiencies were experienced with no access to such a platform for input or information due to communications failures.
- Unexpected community impacts at the household level included:
 - Hot water systems detaching from homes by floating. This left numerous failure points in water supply networks, leakage points from broken plumbing which impacted re-commissioning water supply networks.
 - Hundreds of properties had individual sewage pumping units with specialised electrical control boards that were impacted, creating a supply chain issue for replacement control boards that remains ongoing.
- There was evidence that water managers were completely overwhelmed with information requests on the status of their water and sewerage systems, which is an important function. Without assistance 'on the ground', critical information was delayed that would have enabled mutual assistance to be activated earlier.
- Unfortunately, Western Sydney was being impacted at the same time as the North Coast which impacted on Sydney Water's ability to provide mutual assistance.

1.4 Transition from incident response to recovery

The transition from incident response to recovery, including the roles, structure and procedures of agencies, government, other entities and the community;

There has been significant good will between state agencies with the transition into restoration and recovery, but the transition was ad-hoc. Terms of reference were drafted in

March 2022 post-event for a Water and Wastewater Infrastructure Working Group comprising Infrastructure NSW, DPE Water, Public Works Advisory, Local Government NSW and the NSW Water Directorate.

The roles and responsibilities in the NSW Government's response as it relates to water and wastewater infrastructure need to be clarified and formalised. The impacted local water utilities (councils) were not involved and engaged in this working group and expressed a need to be involved with the planning for recovery of their water and sewerage assets.

1.5 Recovery from floods

Recovery from floods, including:

- i. immediate housing, clean-up, financial support and community engagement measures; and*
- ii. longer-term community rebuilding support;*

Water and sewerage infrastructure has previously not been eligible for disaster assistance funding, however we acknowledge that an exception has been made due to the extensive impact of the North Coast 2022 flood event⁶, in the order of \$145 million. At the time of writing, councils still do not have a clear understanding on how this funding will be accessed. It appears that this water and sewerage infrastructure funding will be delivered on the premise that the NSW government decides what solution is needed before councils can implement the solution. This contrasts with roads where councils decide what is needed and the NSW government signs it off.

The NSW Water Directorate strongly recommends that water and sewerage infrastructure is permanently included in the Disaster Recovery Funding Arrangements (DRFA). On this occasion, DRFA Category B funding has been very much appreciated but is limited in its breadth of coverage and has previously excluded water and wastewater infrastructure as well as waterways and riparian damage restoration, which can have significant impacts on water quality for water supply. The funding is also short term, when some infrastructure repairs will take more than a year to restore. Engineering as well as construction resources to respond to such a large-scale event such as the February 2022 floods are extremely limited. Extension of deadlines and the expansion of scope for funding arrangements needs to be considered.

The DRFA Cat B funding is also focussed on repairing like-for-like for a narrow group of assets without consideration of the interdependency of assets. This results in a reactive and disjointed approach. The outcomes could be significantly improved with investment for building back better in a broader range of asset classes and with an integrated approach. One example of this is the large lengths and depths of riverbank erosion from this event has caused significant damage to road infrastructure and is having impacts to raw water quality for water treatment.

Water professionals and the water industry need to be involved in community led resilient initiatives to support communities to not only recover, but most importantly better prepare and respond to future water supply and sewerage system interruptions during emergencies. Education is essential to ensure that vulnerable communities are adequately prepared to manage with interruptions to minimise risks of public health illness. This includes

⁶ \$145 million for critical infrastructure, source: <https://www.nsw.gov.au/floods/financial-support/grants-faq#toc-million-to-repair-northern-rivers-critical-infrastructure>

information on preparation with storage of safe potable water as well as how to treat potentially contaminated water for essential drinking, food preparation and hygiene.

Concluding comments

We thank you for the opportunity to make this submission. The NSW Water Directorate welcomes the opportunity to participate in the recommendation and implementation stages of the Inquiry if that is appropriate.

Please do not hesitate to contact me at _____ or
if any further information is required on this submission.

Yours sincerely,



Brendan Guiney
Executive Officer | Water Directorate