

QUEENSLAND FLOODS
COMMISSION OF INQUIRY

STATEMENT OF RUSSELL KEITH CUEREL

I, **RUSSELL KEITH CUEREL** of c/- 41 George Street Brisbane in the State of Queensland, Manager, Infrastructure Management, Office of the water Supply Regulator, Department of Environment and Resource Management (DERM), solemnly and sincerely affirm and declare:

Requirement from Queensland Floods Commission of Inquiry

1. I have seen a copy of a letter dated 7 September 2011, which is attachment **RKC-10**, from the Commissioner, Queensland Floods Commission of Inquiry (Commission) to me requiring a written statement under oath or affirmation, and which details the topics my statement should cover.
2. I have also provided a statement to the Commission dated with today's date in regard to information about State Planning Policy 1/03.

Item 1: All State policies, regulations and standards that regulate stormwater management and stormwater infrastructure; a list of the entities that administer these policies, regulations and standards; and identifies for each entity the policies regulations and standards it administers.

3. As Manager, Infrastructure Management (PO6), Office of the Water Supply Regulator, I only have responsibility for the department's management of the Queensland Urban Drainage Manual (QUDM). QUDM is a stormwater planning and design guideline produced by the department in collaboration with industry (principally local governments, developers and their consultants). QUDM does not directly regulate stormwater infrastructure. However, it is often used by local governments in setting their stormwater policies and standards and is something of a benchmark for the industry.
4. I am generally aware that DERM is responsible for a number of legislated requirements that impact on stormwater infrastructure. However, as I do not have a working knowledge of all the requirements, I cannot confidently give an exhaustive list. Those I am aware of are:
 - a. the requirement that local governments prepare management plans to manage urban stormwater quality (Total Water Cycle Management Plans) under the Environment Protection Act;
 - b. authorising of works in water courses under the *Water Act 2000*; and

- c. dam safety obligations with respect any element of stormwater/flood mitigation infrastructure (such as detention basins) which meet the criteria under the *Water Supply (Safety and Reliability) Act 2008*.
5. I am also aware that:
- a. DLGP require local governments to have Priority Infrastructure Plans to support their Infrastructure Charges Plans (for all infrastructure – including stormwater); and
 - b. Main Roads is generally responsible for stormwater infrastructure associated with their roads.
6. Also relevant are Chapters 2 and 3 of QUDM (extracts attached **RKC-11**) which list all the state agency / legislation requirements (as far as could be determined at the date QUDM was last published) that are potentially relevant to the planning and design of a local government's stormwater infrastructure and stormwater management

Item 2: The Department of Environment and Resource Management's (DERM) role and extent of involvement in formulating and administering the policies, regulations and standards referred to in paragraph 1.

7. I can only comment on this item with respect to QUDM and OWSR.
8. QUDM provides guidance to local governments for *formulating policies, regulations and standards that regulate stormwater management and stormwater infrastructure*. QUDM was first published in the mid-1990's and was developed through an equal partnership between Brisbane City Council, Institute of Public Works Engineering Australia and the Department using a specialist consultant and industry consultation.

The only major review of QUDM since its introduction was industry driven and was completed in 2007. It involved a steering committee of industry representatives overseeing the work of a (different) specialist consultant. In conjunction with the review/update of QUDM, the original partnership arrangements were renegotiated with the result that DERM (OWSR) now has sole ownership of QUDM. Future reviews are likely to follow the practice of responding to industry demand.

OWSR has no role in regulating stormwater management and stormwater infrastructure. OWSR does not have any mechanism for mandating the adoption of QUDM. It is up to local governments (generally) to choose the standards and practices it implements. However I understand that much of what is in QUDM is very widely accepted across Queensland (and elsewhere).

Item 3: Whether and how DERM has reviewed, or has plans to review, the adequacy of the measures to mitigate the impact of flooding in policies, regulation and standards or other mechanisms that regulate stormwater management and stormwater infrastructure, including (but not limited to):

- a) Any investigation that has been carried-out or report that has been commissioned or written following the 2010/2011 flood events that addresses the flood capacities of the State's stormwater management and stormwater infrastructure and the associated management of this infrastructure: and
- b) Any briefing notes produced by DERM as a result of the 2010/2011 flood events in relation to measures employed to mitigate the impact of flooding for stormwater management and stormwater infrastructure produced

I am not aware of any plans by DERM to review the adequacy of the measures to mitigate the impact of flooding in policies, regulation and standards or other mechanisms that regulate stormwater management and stormwater infrastructure. The last review of QUDM was completed fairly recently and I am not aware of any demand from industry for another review at this stage.

- (a) I am not aware of any investigations carried-out or reports commissioned or written following the 2010/2011 flood events that address the flood capacities of the State's stormwater management and stormwater infrastructure and the associated management of this infrastructure. The only State stormwater infrastructure I am aware of would be that owned by Main Roads.
- (b) I am not aware of any briefing notes produced by DERM as a result of the 2010/2011 flood events in relation to measures employed to mitigate the impact of flooding for stormwater management and stormwater infrastructure.

Item 4: Your view as to whether the measures to mitigate the impact of flooding in the existing policies, regulations and standards and other mechanisms that regulate stormwater management and stormwater infrastructure and other mechanisms are effective. Please include a description as to your view as to whether there are any shortfalls in, or difficulties with enforcement of, the policies, regulations and standards

- 8. Local governments set and enforce flood mitigation/public safety standards to be met by the stormwater systems in their local area(s) through their design standards and codes for development. Similarly, Main Roads would determine the standards for their stormwater systems.

I am not aware of any general State Government policies, regulations and standards to regulate stormwater management and stormwater infrastructure to mitigate the impact of flooding. I am only aware of OWSR's role in maintaining the Queensland Urban Drainage Manual which local governments may (or may not) chose to use in setting their own standards.

My view with respect to any shortfalls in, or difficulties with enforcement of, the local government policies, regulations and standards that regulate stormwater

management and stormwater infrastructure would be that the situation it is likely to vary across the state with the varying circumstances of each local government.

Item 5: Your view as to the potential for use of flood detention basins, stormwater culverts and backflow devices as measures to mitigate the impact of flood on property and infrastructure, including the advantages and disadvantages of each

9. In my view, each of the above stormwater/flood management measures has a place in mitigating the impact of flood on property and infrastructure – especially on existing property and infrastructure.

The most desirable mitigation measure is to ensure that as far as possible, natural flow paths are understood and their capacities are retained.

My view is that, as with most infrastructure (which can only remain effective within its design limits) stormwater and flood mitigation infrastructure can only deliver reductions in flood impacts for flows up to the design standard adopted. The design standard(s) adopted usually represents what has traditionally been accepted as a reasonable balance between the risk and cost to the community. This is often expressed in different standards for different elements of a stormwater system (e.g. kerb and channelling and the piped network under a road versus the capacity of the roadway itself). However, as in most areas of infrastructure provision, the cost versus benefits and who pays plays a significant role in the standard adopted.

Detention basins are used to reduce peak flows by storing water and discharging that water over a longer timeframe (and hence at a lower flow rate). Systems that involve multiple detention basins must be appropriately analysed and designed to ensure that the basin discharges don't interact adversely to exacerbate downstream flooding.

Culverts are generally designed to maintain the flow capacity of a drainage path that has had an obstruction introduced – such as a road or railway embankment across a creek or gully. Depending on the impact of flows above a culvert's design flow, the whole structure may (or may not) have provision for coping with these higher flows (e.g. a road embankment may be designed to cope with flows which exceed the culvert capacity and overtop it without excessively damaging the embankment). Culverts can block with debris and this is also usually considered in the design.

Backflow devices are generally required on the outlets of stormwater systems which can be subject to receiving water levels high enough to cause water to flow in the reverse direction and potentially exit the system affecting the surrounding area. Areas that require backflow devices are generally low-lying and hence difficult to adequately drain in all potential circumstances.

Item 6: The stormwater infrastructure for which DERM has responsibility.
Your view as to whether the existing stormwater infrastructure in Queensland is adequate for mitigating flood impacts; and if not, what are the inadequacies and how may they be remedied, and what steps, if any, is DERM intending to take to remedy these inadequacies.

10. To the best of my knowledge, DERM is not responsible for any stormwater infrastructure.

With respect to the adequacy of existing stormwater infrastructure in Queensland, my view is that it is likely to be highly variable across local government areas and between older and newer systems. The reasons for my view are:

- The broad range of climatic conditions across the state (e.g. frequent high intensity rainfall in the tropics to infrequent lower intensities in the southern inland).
- The range of topographic conditions in which stormwater systems are required to operate (e.g. flat coastal lowlands with tidal influences to steep / short response-time areas – sometimes in the same catchment)
- The capital cost of stormwater systems (which are generally borne by the developer) and the ongoing operation and replacement/upgrading costs (generally borne by councils).
- The nature of stormwater infrastructure – i.e. it has traditionally been made-up of mostly “passive” hidden assets required to perform infrequently; hence maintenance/upgrading expenditure may not be as high a priority as more obvious or “active” assets.
- Changing rainfall intensity standards due better rainfall data from longer records and climate change
- Variable financial capacity across councils to fund upgrades/improvements to older systems
- Increasing development on urban fringes resulting in increased peak discharges and potential overloading of existing downstream systems

I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the *Oaths Act 1867*.

Signed .

Russell Keith Cuerel

Taken and declared before me, at Brisbane this 14th day of September 2011

~~Solicitor/Barrister/Justice of the Peace/Commissioner for Declarations~~