**Submission to flood commission**

## 1. Awareness of flooding and responses

### *Background*

Talking to neighbours and residents in the Graceville to Corinda area of Brisbane, and the Ipswich area which were affected by the flood, we found people could not easily relate their local situation to the predictions given for the City Gauge in Brisbane and tended to respond on instinct either very conservatively or believing it wouldn't happen. Also people were not able to relate easily to the river height gauging station data or graphs on the Bureau of Meteorology web site which I actually found particularly useful. For example, 4.3 m at the City Gauge was 9.1 m at Oxley Creek mouth gauge.

Further, people were generally ignorant of the elevation of their properties above sea level unless they had been through the 1974 flood and the great majority (including me) did not know that property elevation was accessible on Pdonline through the Brisbane City Council website. Those who had recently moved to the area tended to base their judgements on what the real estate agent had said or that Wivenhoe Dam would prevent the next flood.

This confusion was not helpful to appropriate preparation and monitoring of the flooding in the local area.

Once the power went off, many were without their mobile phones after a day or so because they did not have a car charger and since the mobile in some cases has become the default radio, some people were not able to access information through the radio. This led to quite a lot of 'shared ignorance' and unrealistic expectations of the flood.

The flood maps on the Brisbane City Council website were good and informative but because they don't give a depth of inundation, some people (of those that knew of its existence) did not find them particularly useful. The general information provided by the council and through ABC national radio was excellent but was not able to address local area flood predictions.

I was able to access the Bureau of Meteorology site for the local river height data using my notebook computer and mobile phone as a modem and charge them from car chargers. This became very useful information for near neighbours. On the basis of the above I make the following recommendations for the consideration of the commission.

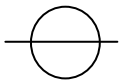
These recommendations are also applicable to other flooded areas in Queensland and possibly nationally.

**Recommendations**

*Recommendation 1*

That all streets that were flooded in any part have easily seen (iconic) flood markers installed such as the template below (Figure 1) that provides a reference for everyone about major floods. The example below is for the Chelmer to Oxley area of Brisbane. Some negotiation between Council and the Bureau of Meteorology would be required to ensure access in the simplest manner is available in addition to the current information on the Bureau of Meteorology and Brisbane City Council websites. These markers could be fixed to power or street light poles or their own post ands also be placed adjacent to bike paths and in parklands. An example of a more elaborate flood marker for the 1974 flood is at Oxley Common on Sherwood Road, Rocklea.

**Flood marker**



This mark is 11 metres above mean sea level (AHD).

It is approximately: 1 m above the 1974 flood

2 m above the 2011 flood

Flood levels will vary with each flood and major rainfall event.

The nearest monitored river height gauge to this marker is Oxley Creek mouth - station number 540274.

To check current and predicted river levels go to

www.bom.gov.au/qld/floods/540274

or

phone 13 FLOODS and when asked, enter the station number 540274 for a recorded message of the current height, rate of rise or fall, and predicted maximum height within the next 12 hours.

If this river height station has been damaged or is not available, the closest upstream station on the Brisbane River is at Jindalee Bridge, station 540192, where the river water level is expected to be similar to that of Oxley Creek mouth (or levels will be approximately ? m higher than the Oxley Creek mouth site).

Add necessary disclaimers……

**Figure 1.** Example flood marker to be fixed to posts in flooded streets to ensure awareness of past flooding and to relate predictions in future flooding events to historic conditions. The wording would need to be changed to 'below flood level' for some inundated streets.

*Recommendation 2*

Each rate notice to properties have the property elevation clearing marked on the rate notice as extracted from the Council's database or other appropriate source, together with the above flood marker (Figure 1) and where it can be found on the street so that residents can directly relate their own property to past flood levels and future flood scenarios. Additionally, a statement be included "If your residence is close to, or below the level of the 1974 flood, it is strongly recommended that you purchase a car charger for your mobile phone so that your phone can be charged during any power outage associated with a flood. During the wet season, a battery radio, torch and spare batteries should be readily available". This

information would only need to be extracted once for each address and then be a permanent part of the rate notice.

*Recommendation 3*

For rental premises in flood prone areas, the content of recommendation 2 be required to be placed on the inside of the main front door of the residence and that the information be provided on the Urban Utilities bill so residents not receiving a rate notice are aware. Since the advent of electronic bill paying, these notices may not be read by everyone and an annual mailing may be required to all residences prior to the wet season.

## 2. Wivenhoe dam flood operation

### *Background*

Whether the management of the dam to maximise water supply and minimise flooding was achieved will be determined through the investigations of the Flood Commission. However, it would appear that the accountability for the management of the dam to achieve flood control is not consistent with the outcomes of 'less than optimal management' and the disaster that may be caused financially, socially and to loss of life. Levels of accountability and responsibility have to be seriously improved to be consistent with the costs of flood damage. Given that there are alternatives to water supplies during drought through the desalination plant at Tugun and the Purified recycled water infrastructure, then in wet seasons, flood mitigation needs to take high priority.

Secondly, having a rigid Manual of Operational Procedures[1] to manage the dam's role in flood mitigation seems out of place with modern methods of modelling and decision making based on multiple lines of evidence and probabilities of various events occurring. The operation manual should be the 'guide' to be followed but only to the point where the evidence or prediction of a changed situation that may influence the outcome will require a more detailed process. In this case an expert emergency committee is required who have the direct responsibility to monitor the situation during any wet season and potential flood event and collectively use their very best judgement to minimise all adverse consequences.

The decision making criteria in the Manual of Operational Procedures appears to be rather simplistic and linear for the range of SEQ regional events and unexpected situations that may arise. The complexities of rainfall distribution, river flow peak and duration, tidal fluctuations and atmospheric pressure changes could be incorporated along with dam management through regional scale modelling. Then scenarios could be run in real time and risk and uncertainties in proposed operations assessed. There is appropriate parameter estimation and optimisation, risk and complex model uncertainty evaluation software readily available to refine these models. They can be used as a convergent approach with technical experience and expertise to minimise flooding.

The Manual of Operational Procedures for flood mitigation needs to be submitted to comprehensive review every 5$^{th}$ year by a different independent expert panel each time to advise of risks and consequences of the current procedures in relation to climatic and local floodplain management changes and give prioritised recommendations on actions to improve the management and minimise personal and environmental harm. This is an important upgrade to the review process given in the existing manual.

From the Manual of Operational Procedures, it appears that there is only a nominal requirement to consider rainfall and flooding in other parts of the SEQ region that will impact on the Brisbane River below Wivenhoe and potentially result in a backup of flow in flooded inflowing tributaries in determining management strategy for the dam. This seems too narrow for the role of the dam and needs to be clarified. The dam has to be managed within the broader context of the prevailing conditions in the SEQ Region.

Thirdly, it would appear that the operators of the dam were not aware of local stakeholder concerns in formulating their response, or appeared to not respond to the concerns or alternatively did not offer any transparent description of why local stakeholder concerns were not considered. This is inadmissible. All inputs given to SEQWater to an impending, or during a flood management situation should be required to be acknowledged and a informative response prepared, given and made available on their web site to justify actions

being considered or ignored. Greater transparency is required without compromising basic security of operation although what is necessarily secure information could be re-evaluated.

Fourthly, SEQWater would significantly benefit from an independent stakeholder advisory committee with an independent chair to report directly to the CEO and in parallel directly to the appropriate minister of government, meet twice a year and ensure that a broad range of perspectives are considered by the dam operators. There does not appear to be a process for formal communication and consideration of requests in the current operation of SEQWater.

The other reason for such a stakeholder committee is that all institutional arrangements lead to institutional dysfunction over time and inwardly looking bureaucracies and protocols that encourage group think and jargon without due consideration of the broader stakeholder interests and views. This has been evident in the last few years with the response to the Victorian bushfires, the recent bushfires in Western Australia and the inability of the Navy to have suitable landing craft available for cyclone Yasi. The US government response to the New Orleans tornado has similarities worth evaluating. The stakeholder committee should include as a minimum; city and regional councils, Bureau of Meteorology, Department of Main Roads, QR rail, Port authority, downstream landholder and community representatives and have technical experts attend as observers to provide necessary background information.

The Board of SEQWater, as per their website, appears to have only one member with a hydrologic background with the remainder having business skills. I strongly suggest that another technical person be appointed as an independent to ensure sufficient questioning and debate on the technical aspects of dam and flood management procedures and protocols for SEQWater business at the highest level in the organisation.

***Recommendations for Wivenhoe dam management***

*Recommendation 1*

Accountability for management of Wivenhoe dam to minimise flooding be upgraded substantially so that it is consistent with the social and economic cost of flooding and responsibilities are clear. Management of dam operation be upgraded to ensure the best possible decision is made in circumstances that may differ from the expected including formal evaluation of scenarios in real time. An upgraded Manual of Operational Procedures for flood mitigation also explicitly consider the whole of the SEQ region in order to balance dam safety, flooding risk and minimise damage.

*Recommendation 2*

That the Manual of Operational Procedures of the dam for flood mitigation be reviewed and the rigidity be modified to allow collective decision making in times of unexpected conditions. That the operating procedures be externally and independently reviewed by different experts every 5 years to ensure the best possible process is outlined and appropriate decisions can be made. This would be in addition to, and follow on from, any internal review.

*Recommendation 3*

A regional scale flood model be incorporated into the decision making steps of the Manual of Operational Procedures that allows real time scenarios, risks and uncertainties to be evaluated for rainfall and flooding events to minimise downstream damage and provide greater transparency and hence trust by the community that the best management approach is being followed.

*Recommendation 4*

SEQWater establish a proactive stakeholder committee to meet and advise SEQWater and the appropriate Government Minister simultaneously of issues that dam management will raise with a view to increased awareness by SEQwater of the breadth of consequences of dam management and to minimise 'institutional dysfunction' and internal focus.

*Recommendation 5*

In view of the serious consequences of dam management, transparency needs to be improved and any informed suggestions given to SEQWater need to be dealt with by SEQWater and provide a written response of why a suggestion is not used or when an appropriate suggestion will be implemented as well as providing this on their web site maybe as 'frequently asked questions'.

*Recommendation 6*

The board appoint an additional member with technical skills and experience in flood hydrology expertise to provide adequate technical questioning and debate as well as close monitoring of the technical operation of SEQWater and relevant new emerging knowledge.

***Reference***

[1] Manual of operational procedures for flood mitigation at Wivenhoe dam and Somerset Dam, (2009) Revision 7, November 2009, SEQWater, Brisbane.

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Roger Shaw