MJ O'Brien
[redacted]

25 November 2011
Ref BRI-LET-003

Queensland Floods Commission of Inquiry
Level 30, 400 George St
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QLD 4000

[redacted]

Attention: [redacted]

Review of Hydraulic Modelling

Since my earlier letter, Ref BRI-LET-002 of 23rd November, I have become confused in relation to Mr Babister's position on the measured height of the Brisbane River during the peak of the flood.

Before the Commission on October 26th, in response to a question from Mr O'Donnell, Mr Babister confirmed that based on the most recent information, Mr Babister formed the view that 4.46 was the appropriate level for the maximum height the water reached at the Port Office.

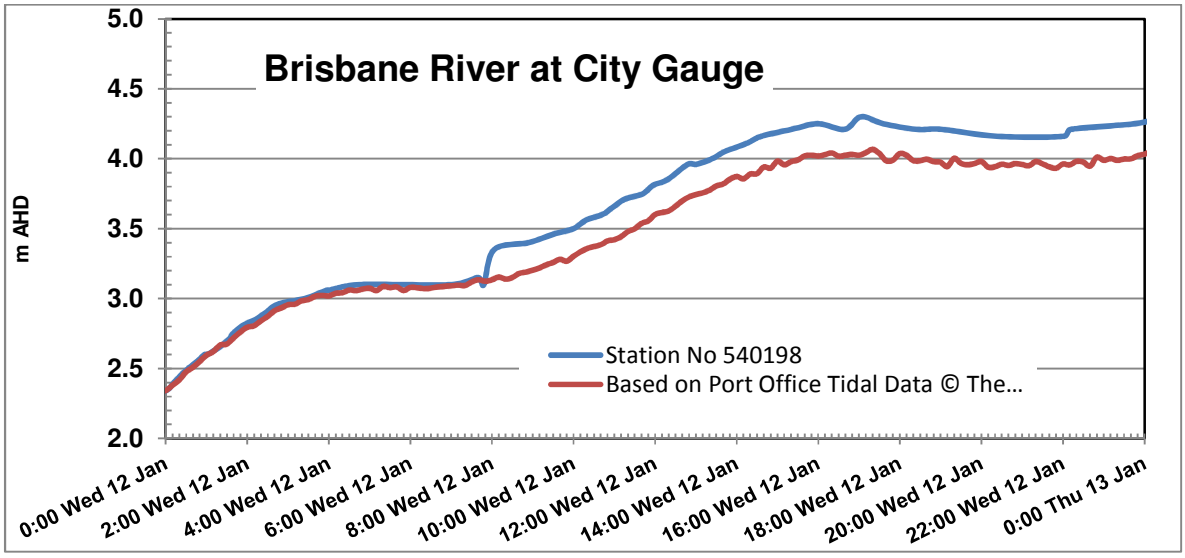
However the subsequent letter dated 18 November 2011, Ref L111118_111024 from MWAwater to the Queensland Flood Commission of Inquiry (**WMAwater letter**) contains the following comment in relation to the two different measurements of the height of the Brisbane River at the Port Office: -

WMAwater understand that neither of the gauge operators has identified errors in the gauge operation during the event. Seqwater have indicated that the recorded levels were verified according to best practice by manual gauge readings during the 2011 flood on several occasions. It is therefore unclear which, if either, of the gauges is "correct," and the differences in readings remain a source of uncertainty that requires further investigation.

The two gauges in question are: -

- River Heights for the Brisbane River at City Gauge Station No 540198 owned by SEQWater, and
- Tidal Data for the Brisbane Port Office owned by Maritime Safety Queensland (MSQ), Department of Transport and Main Roads

My comparison of the data from the two gauges over the period in question is shown in the plot below.



The above indicates that the gauge, Station Number 540198, experienced a displacement of approximately 250 mm between 07:48 and 08:09 Wednesday 12th January. Subsequently Station Number 540198 reported a river level approximately 200 mm higher than data provided by MSQ. Since gauge 540198 apparently records based on exceeding a particular change in level, it would seem that the displacement actually occurred close to the time of the recorded jump, i.e. 08:09 on Wednesday 12th.

The behaviour exhibited by the gauge Station Number 540198 is certainly not indicative of a natural event.

Rather than as indicated before the Commission on October 26th, that the data from Gauge 540198 was confirmed by manual gauge board readings, I have received unconfirmed advice that gauge 540198 was actually adjusted to match the reading from the gauge board. Presumably before the adjustment, the gauge board readings did not match the readings from Station Number 540198.

Again, unconfirmed advice is that the change in the reading from Station Number 540198 is due to the gauge being adjusted remotely to correspond with *"a level reported from an eye witness reading of the gauging board at Kangaroo Point hence the step in the data. The reading was taken at a time when the current speed would have been over 6 knots (a very strong current) and the level on the board pushed up well above the average level. It is difficult to achieve an accurate reading from a tide board in fast moving water as the force of the water against the board forces the level up"*.

I have been advised that checks of the MSQ gauge prior to the flood event and, subsequent independent calibration checks, indicated that it would be expected to read correctly.

A potential source of discrepancy is that both pressure sensors are calibrated to the water density that they operate in. The density of the water in the Brisbane River during the flood could be expected to have varied from brackish to sediment laden fresh water. The MSQ gauge is apparently calibrated to salt water and it is unclear exactly how Station 540198 was calibrated.

However, depending on the zero for each of the gauges, a correction from clear fresh water to clear salt water would not be sufficient to explain a 200 mm displacement. In addition it is likely that due to the sediment load in the Brisbane River the water flowing past the sensors would have a density substantially higher that of fresh water.

Request for Clarification

I seek clarification from the Commission as to which of the above two statements from MWAwater and Mr Babister the Commission will base their findings.

Again, I thank the Commission and the Independent Engineer for their consideration.

Yours Sincerely

Mick O'Brien